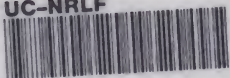


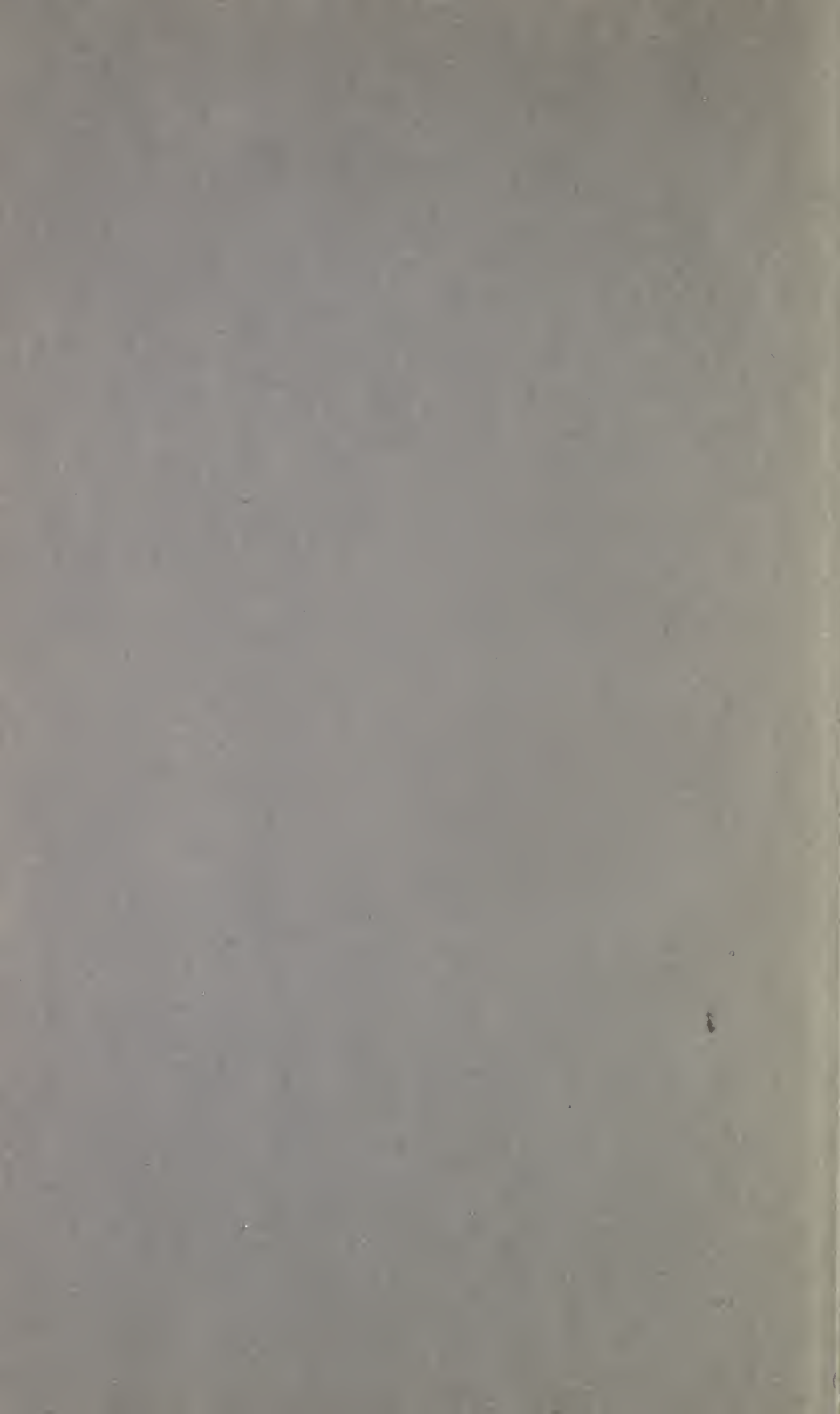
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REPORT

OF THE

COMMISSION ON INDUSTRIAL EDUCATION

3. L. Griffin
SUBMITTED TO THE

SENATE AND GENERAL ASSEMBLY

OF THE

STATE OF NEW JERSEY

IN ACCORDANCE WITH

Joint Resolution No. 11, Approved April 14, 1908

TRENTON, N. J.
MACCRELLISH & QUIGLEY, STATE PRINTERS.

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REPORT.

To the Senate and General Assembly of the State of New Jersey:

The Commission on Industrial Education begs leave to submit the following report :

A Joint Resolution of the Senate and General Assembly of the State of New Jersey, approved April 14, 1908, provided for the appointment, by the Governor, of a Commission on Industrial Education. The resolution read as follows :

BE IT RESOLVED *by the Senate and General Assembly of the State of New Jersey:*

1. The Governor is hereby authorized to appoint a commission of five persons, citizens of New Jersey, to inquire into and report to the next Legislature upon the subject of promoting industrial and technical education; the commissioners to be appointed by virtue of this act shall serve without compensation, but shall be repaid their expenses actually incurred in and about the performance of their duties, and may employ a secretary and all necessary and clerical and other assistance; provided, however, the total expense of said commission shall not exceed three thousand dollars.

2. The Commission shall investigate the needs for education in the different grades of skill and responsibility in the various industries of the commonwealth. They shall investigate how far the needs are met by existing institutions and what new forms of educational effort shall be advisable, and shall make such investigations as may be practicable through printed reports as to similar educational work done by other States, by the United States Government and by foreign governments.

3. All expenses of the Commission as herein provided for shall be paid out of moneys specially provided therefor.

4. This resolution shall take effect immediately.

Governor John Franklin Fort appointed the members of the Commission on May 26, 1908, naming June 2 as the date for organization.

REQUIREMENTS OF THE JOINT RESOLUTION.

From the terms of the resolution under which the Commission was constituted it was evident that what was desired was (1) a thorough investigation of the needs of the industries in respect to industrial or technical training; (2) a statement of the extent to which those needs are met by existing institutions; and (3) as the result of a searching examination of conditions in this State and elsewhere, some definite suggestions for the promotion of industrial education in such manner as might best serve the interests of the commonwealth and its citizenship.

ASCERTAIN NEEDS AND DEMANDS.

The Commission early realized the necessity of going directly to those engaged in the industries for information. The recommendations in its report have grown out of the demands of the State, as made known by those occupied in the various industries—this information being supplemented by the facts as to what is accomplished in existing educational institutions, at home and abroad.

EXTENT OF INDUSTRIAL INQUIRY.

Inquiries designed to bring out both the needs and practical suggestions looking toward the improvement of conditions, were addressed by the Commission to employers and workers everywhere in the State. This correspondence was supplemented by interviews with the representatives of a large number of firms, located in every section of the commonwealth. Replies were received from over 2,000 firms engaged in manufacturing, building, or other productive industries in the State, and employing upwards of 250,000 workers, male and female. The results of

this inquiry doubtless form the most comprehensive collection that has ever been made of authoritative statements as to industrial conditions and needs in New Jersey.

RESULTS OF INDUSTRIAL INVESTIGATION.

The results of the investigations indicate clearly: (1) As the direct outcome of modern industrial conditions—factory organization, the introduction of machinery, and “piece-work”—the apprenticeship system has been virtually abandoned as a means of instructing the young in the various trades. (2) There is a lack of skilled and efficient workmen, and this will be largely increased unless a better means of vocational training is found. (3) Although the compulsory attendance period in the public schools has been extended gradually in New Jersey (as elsewhere in the United States), the schools have not been able to offer vocational training. Fully ninety-five per cent. of the pupils leave school between the ages of fourteen and seventeen, and without having formed any idea as to what trade or vocation they should follow; in consequence, they drift into occupations, rather than select those which might be most nearly suited to their aptitudes, and their progress is generally arrested at an early age, because of the restricted character of their experience, and the failure to receive supplementary instruction. (4) The trades have become so specialized that there is but little chance for a learner to go beyond the narrow limits of the work to which he is assigned, unless he has supplementary training. (5) The workers, mechanics, or craftsmen in the several trades are deeply sensible of their lack of opportunities for vocational training during the early years, and grown men among them would gladly take advantage of industrial schools, if these institutions were established. (6) Although business conditions are such that the employers, in most instances, have neither the time nor the inclination to conduct vocational schools within the factories, they would gladly welcome any suitable means of providing the workers with the instruction which the latter require. (7) There is an urgent demand for facilities for industrial education to supplement the training of the shops.

DESCRIBE LOCAL NEEDS.

The returns indicate the foregoing, and much more. They furnish an extensive fund of information as to local conditions throughout the State. They show, in detail, the educational problems of the industries, and point strongly to the need of a system of industrial schools adapted to local requirements. There is not space in this report to include the detailed returns, but a few illustrations of the needs will suffice. Workers in the building trades are numerous in every locality. The need of these is greatest for industrial education, and the opportunity the least. Comparatively few can read or understand a drawing, and as for expressing their ideas on paper by means of sketches, it is generally out of the question. In the important machine industries, a knowledge of workshop mathematics, or applied mechanics, ability to follow working drawings, and to make a suitable sketch, as well as familiarity with the practices of the trade, are matters in which many are found wanting. Industrial drawing, industrial mathematics and industrial English are required by the workers in any industry, whereas in special lines, industrial chemistry, industrial art, or other particular courses are demanded.

INDUSTRIAL EDUCATION DEMANDED.

There is a remarkable unanimity of opinion on important points in the replies to the Commission's queries, and this agreement is shared by the workers as well as the employers. Almost unanimous is the demand for more industrial schools, and the expansion of those now established in the State. Quite unanimous, likewise, is the opinion that manual training, as taught in the public schools at present, is a valuable preparation for the industrial-vocational schooling which should follow, but does not fulfill the requirements of the present movement for industrial education. Manual training is not vocational in its aim. It does not prepare for a specific vocation, or trade. Its purpose is purely cultural, and it is of value to all alike, whether a trade or a profession is entered upon.

INDUSTRIAL IMPROVEMENT SCHOOLS DESIRED.

Evening industrial improvement schools, under boards chosen largely because of the connection with the industries, are the quite unanimous choice of the non-agricultural industries of this State. Short courses for farmers, given at numerous convenient centres in the State, represent the form of practical vocational instruction chiefly desired by the agricultural industry. The industrial improvement schools would afford the workers from each industry the theoretical instruction necessary to that particular industry, but the shop attachment would be restricted, if not omitted altogether. The practical experience would be gained in the daily employment. However, those not employed would not be debarred from attendance. For an industrial improvement school, neither an expensive building nor costly equipment is necessary. In its simplest form, a room, some drawing utensils, vocational text-books, a skilled instructor and the students, are the chief requisites. The importance of this kind of school may be measured not only by the demand from this State, but by the fact that throughout the civilized world the evening (or partial time day) industrial improvement school enrolls twenty pupils to every one who attends the other types of industrial vocational schools.

TRADE SCHOOLS UNDESIRABLE AT PRESENT.

Although the majority of industrialists in New Jersey look with favor upon trade schools—meaning, thereby, those schools for specific industrial training in which the shop work predominates—the consensus of opinion shows a well-defined opposition to their introduction on the grounds (1) that they are too expensive a form of education for the present; and (2) even if trade schools were provided, at great expense for equipment and maintenance, it would be difficult to reach any large number of individuals through them. The average person leaves school early in life to go to work, and the necessity of earning his daily bread prevents him from attending a day trade school. He

might be induced to remain in the public schools by the offer of vocational instruction during the high school period, but it is questionable if at that early age he would have formed an idea of the vocation he should follow. The schools are fully occupied in giving the necessary general training up to the time when the majority leave school. Nowhere in the world, for instance, can a system of schools be found where vocational instruction is given, throughout the State, to pupils under the age of fourteen.

OBJECTION TO PARTIAL-TIME DAY INDUSTRIAL SCHOOLS.

The New Jersey investigation shows that the agency of the State having in charge the industrial schools will await the co-operation of the manufacturer before attempting to introduce partial-time day schools, that is, schools which would take pupils from among those at work, and give them industrial instruction in one or two half-day sessions during the week. Although the partial-time day school may become popular in the future, at present only a small percentage of the manufacturers of New Jersey favor this form of instruction, which, it is said, would tend to disorganize the factories and shops.

RUTGERS AND AGRICULTURE.

Having presented briefly, in the above, the needs and demands, as to training, of the industries of the State, it is now in order to review the provision for industrial education which already has been made in the commonwealth. Rutgers College, at New Brunswick, receives the quota for New Jersey of the Congressional grants for agricultural instruction, the total amounting to \$59,800 annually, at present. A department, known as the "U. S. Agricultural Experiment Station," is associated with the college. Rutgers is destined to be the chief centre for the maintenance of short courses in agriculture and horticulture. In this connection, the Commission invites attention to a paper on the needs of the agricultural industries of this State, prepared by Dr. Edward B. Voorhees, director of the U. S. Agri-

cultural Experiment Station, at New Brunswick, and president of the State Board of Agriculture. The article is printed as Appendix B of this report.

RUTGERS, PRINCETON, STEVENS.

The Commission does not find it necessary to report in detail on the character of the higher technical instruction given at Rutgers, at Princeton, and at the Stevens Institute of Technology, of Hoboken. The higher technical or engineering colleges of the land furnish the necessary education for the training of engineers. It is the universal lack of facilities for *supplemental*, or *elementary* trades instruction that must cause wonder and astonishment. Only recently has this great need been fully appreciated.

FIRST LAW PROVIDING INDUSTRIAL EDUCATION.

The Philadelphia Centennial, of 1876, awakened American manufacturers to an appreciation of the industrial results achieved by European States through their efficient vocational schools. In 1881 the manufacturers of New Jersey united to secure a State law that was to be far-reaching in its effects. The law of that year provided for "schools for industrial education," and under this enactment New Jersey was the first State of the Union to make effective provision for a system of State-supported industrial schools, under independent boards, appointed by the Governor. The practical intent of the great act of 1881, which is still in force, is plainly indicated by the wording of the preamble, which reads as follows: "WHEREAS, The establishment of well-conducted and liberally-supported schools for the training and education of pupils in industrial and mechanical pursuits must tend to supply a growing want in each community of skilled mechanics, artisans and agriculturists; and WHEREAS, It is especially the duty of the State to afford good educational facilities to its youth in those technical studies which are directly associated with the material prosperity of its people; therefore, etc."

SCHOOLS UNDER INDUSTRIAL EDUCATION ACT.

Three State schools have been established under the Industrial Education Act of 1881—the Newark Technical School (1885), the School of Hoboken (1888), and the Trenton School of Industrial Arts (1898). The Hoboken School is operated in conjunction with the schools of the city. It is co-educational, and offers instruction chiefly to those who come, during the day, from the seventh and eighth grades of the public schools. The Trenton and Newark Schools are co-educational, and give instruction almost entirely in the evening to those who are at work during the daytime. The last-named schools afford instruction of elementary and secondary type. The Newark Technical School was the first to be established under the Industrial Education Act. Its growth has been persistent and steady. It has withstood the temptation to become an institute of technology, and has hewn to the practical lines laid down by the Industrial Education Act. Its graduates are found among the “captains of industry.” Their record as to financial earnings (see Appendix C) is a striking illustration of the money value of the right sort of industrial training. The students of the Newark Technical School and of the Trenton School of Industrial Arts are drawn chiefly from among those who leave the elementary school early in life in order to go to work, and they are earning their daily bread while obtaining a technical education. It speaks well for such institutions that the average graduate of the Newark Technical School, for instance, has added an income of one thousand dollars per annum to his earning capacity, above that which he would have had if he had not attended the evening school. And the economic value of industrial training is not to be disregarded. The economic need will bring back to the evening schools thousands who will learn to do their work better and to perform a greater service to society.

THE MANUAL TRAINING ACT.

The laws of New Jersey authorize the duplication, from the treasury of the State, of amounts expended for manual training

by any school district—to the extent of five thousand dollars per district—provided that not less than two hundred and fifty dollars is raised “by special district school tax, or by subscription, or both.” At present over fifty districts have availed themselves of the provisions of the Manual Training Act. In several cities local appropriations have been made for evening drawing courses also, and the latter are largely attended. The benefits derived from this instruction can hardly be overestimated.

INDUSTRIAL SCHOOL FOR COLORED YOUTH.

The Manual Training and Industrial School for Colored Youth, at Bordentown, is now under the supervision of the State Board of Education. Until recently, little more was done here than to duplicate the opportunities offered in existing public schools, but the school now finds its more useful career along the lines of Hampton and Tuskegee.

PROVISION IN OTHER STATES.

Several other States have laws designed to promote manual training in the public schools, to popularize agricultural instruction, or to inaugurate local schools of agriculture (see Appendix D). Massachusetts and New York are the only other American States which have enacted laws for the establishment of systems of schools for both the agricultural and the shop or factory branches of industrial education. Massachusetts led the recent movement for industrial education. Its commission recommended an independent system of industrial schools, under a separate State commission. Bills providing similarly for the promotion of industrial education are now before the Legislatures of the majority of the States. The present Massachusetts Commission on Industrial Education already has over 2,500 pupils enrolled in the new institutions, and is about to open several additional schools. A State law of New York, passed during the spring of 1908, provides for separate industrial schools, under the regular boards of education and the supervision of its

uniquely centralized State Department of Education. Wisconsin and Connecticut have made restricted provision (see Appendix D) for establishing trade schools. Georgia has eleven "district agricultural schools," under boards appointed by the Governor. Alabama has nine similar institutions. Oklahoma, in 1908, established a State Commission for Agricultural and Industrial Education.

INDUSTRIAL EDUCATION ABROAD—GERMANY.

The breaking up of the apprenticeship system has been universal in Europe as well as in America. However, in Europe general provision has been made for industrial training in schools, to take the place of the apprenticeship tuition. Germany has made greater advance than any other country in providing industrial instruction for the average worker. Starting over a century ago with Sunday schools, in which industrial drawing was taught, Germany progressed to evening industrial improvement schools, which, since 1871, might be made compulsory by municipal vote, and is now rapidly approaching the model set by the Kingdom of Wuerttemberg. In 1906 that State required compulsory partial-time day schools to be established by any community having at least forty youths between the ages of fourteen and eighteen years engaged in commerce or industry, and all such individuals are obligated to attend the industrial improvement schools, at least seven hours per week, for three successive years. The daily employment furnishes the practical experience, to supplement the theoretical training. Ordinarily, the better industrial improvement schools have shop attachments for the purpose of demonstration, and for additional training. Either through State law or municipal action, practically the whole industrial population of Germany is now obligated to attend evening (or partial-time day) industrial improvement schools during the first years at work, or between the ages of fourteen and eighteen. The maintenance of the institutions is usually divided equally between the State and the localities. Instruction is given for specific trades. Facilities are also afforded for evening instruction in similar schools for older apprentices, or for journeymen, and

great numbers attend such institutions. Numerous efficient trade schools also exist. The unions vie with the employers in the encouragement of all forms of industrial training. In all States of Europe in which the industrial improvement schools have been universally successful, they are under independent boards connected with the State Departments of Commerce and Industry, and not with the departments of public instruction having in charge the ordinary public schools or the evening schools for general subjects (*i. e.*, "general improvement schools"). And, in the States mentioned, it is true that first the attempt was made to carry on industrial improvement schools directly under the Departments of Public Instruction.

INDUSTRIAL EDUCATION IN EUROPE.

In the other leading countries of Europe it is considered the duty of the State to establish, promote and supervise training for the industrial vocations. The Swiss cantons, France, Austria, Hungary, the British Isles, Italy and the Scandinavian States are following the lead of Germany, whose systems of industrial schools have reared up a people universally skilled and efficient, whether in the shop, field, or household. (For more detailed information, reference must be made to Appendix E). Denmark has accomplished more for its rural population, through industrial training, than has any other State. The success of the lower grade agricultural and industrial schools of France, since being placed under the direct control of the ministries of commerce and industry, and of agriculture, is to be remarked. Likewise, the creation of a State Department of Agriculture and Technical Instruction in Ireland has given a noteworthy impetus to the establishment of special industrial and agricultural schools of elementary grade. In Scotland the technical schools of Glasgow and Edinburgh, in England, those of Manchester and Birmingham, may be cited as among the most efficient and costly foundations, but it is equally necessary to observe the general lack, in England, of State-wide provision for the training of the great body of workmen.

CONCLUSIONS AND RECOMMENDATIONS.

As the result of its inquiry and deliberations, the Commission unanimously urges the introduction of such suitable forms of industrial training as are demanded by the several municipalities. The industrial school, more than any other type of educational institution, must vary in scope and curriculum according to the industries of the locality. Manual training in the public schools should be encouraged, especially up to the completion of the compulsory attendance period. Industrial education, *i. e.*, vocational instruction, should be provided for those who have completed the compulsory attendance period, and who desire to take up an industrial vocation at a later time. There is most urgent necessity for the establishment of industrial schools for those who leave the ordinary school early in life, to go to work. The records of the Commission show that approximately five-sixths of those who enter the lower grades of the elementary school drop out before the completion of the eighth grade. They drop out chiefly because of the necessity of earning a livelihood. The masses of these individuals cannot be reached by any sort of a day vocational school. They must get their training in the evening, and the number of such is approximately ninety-five per cent. of the total of individuals who can be reached by any type of industrial school which trains directly for a vocation. A great difficulty in the organization of industrial schools of elementary grade, at present, is the lack of vocational textbooks—both special and elementary in character—as well as the lack of instructors qualified to undertake the very practical teaching that is required. The commission feels that with proper organization these problems may be worked out successfully, as has been done in certain States abroad. The Commission is further convinced that the best results are to be achieved by the establishment of a permanent State Commission on Industrial Education, with local boards of trustees, independent of the present boards of education, and appointed by the executive heads of the various municipalities. These local boards should have full charge and control of the industrial schools, subject only to

the supervision of the State Commission on Industrial Education. The Commission should have authority to compile and publish the necessary text-books, and to arrange for lectures for the promotion of industrial education.

As the result of its investigations and careful consideration of the subject, your Commission would further recommend the enactment of the following proposed law as the best means of promoting industrial education, and meeting the need for it in this State:

AN ACT providing for the establishment of schools for industrial education (Revision of 1909).

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*:

1. The general supervision and control of public industrial education shall be vested in a Commission on Industrial Education, which shall consist of five citizens of this State, at least three of whom shall be engaged in industrial pursuits. The members of the commission shall be appointed by the Governor, within thirty days after the approval of this act, and those first appointed shall serve for one, two, three, four and five years, respectively, the terms of the first appointees to be designated by the Governor at the time of their appointment, and thereafter one member shall be appointed each year for a term of five years. In case of a vacancy, the successor shall be appointed by the Governor for the unexpired term only. The Governor shall have power to remove any commissioner for any cause not religious or political, which will promote the efficiency of the service, and to fill such vacancy in the same manner as other vacancies are to be filled. The Governor shall be, *ex officio*, a member of the commission.

2. The commissioners shall receive no compensation for their services, but all their necessary expenses incurred in the performance of their duty shall be paid by the State Treasurer, upon the warrant of the State Comptroller.

3. The said commission shall have power to frame and modify by-laws for its own government;

II. To elect its president and other officers;

III. To prescribe and enforce rules and regulations necessary to carry into effect the purposes of this act;

IV. To authorize the payment by the State Treasurer, upon the warrant of the State Comptroller, of the necessary incidental expenses incurred by the members of the commission in the performance of their official duties;

V. To make and enforce rules and regulations for the employment of teachers in the industrial schools which may be established under the provisions of this act;

VI. To appoint a secretary, who shall be the executive officer of the commission and shall perform such duties as shall be assigned to him by the commission. He shall receive such compensation as the commission shall fix;

VII. To employ such clerical assistance and such experts as they may deem necessary, and fix their compensation, provided that the salaries of the secretary, clerks and experts shall not exceed in any year the amount to be annually appropriated for such purpose.

4. The commission shall report annually to the Legislature in regard to all matters committed to its care.

5. Whenever any board of education, school committee or other like body of any municipality in this State, or the Commission on Industrial Education, shall certify, or shall have heretofore certified, to the Governor that a sum of money not less than one thousand dollars has been contributed by voluntary subscriptions of citizens or otherwise, as hereinafter authorized, for the establishment in any such municipality of a school or schools for industrial education, it shall be the duty of the Governor to cause to be drawn, by warrant of the Comptroller, by himself, out of any moneys in the State Treasury not otherwise appropriated, an amount equal to that contributed to the particular municipality as aforesaid for the said object, and when any such school or schools shall have been established in any municipality as aforesaid, there shall be annually contributed thereafter by the State, in manner aforesaid, for the maintenance and support thereof, a sum of money equal to that contributed each year in said municipality for such purpose; *provided, however,* that the moneys

contributed by the State as aforesaid to any municipality shall not exceed the sum of seven thousand dollars.

6. Whenever the establishment of any school or schools for industrial education in any municipality shall have been or shall be reported to the Governor, as hereinbefore provided, there shall be created in the said municipality a board of trustees, which shall have charge and supervision of all industrial schools in said municipality, under this act, which shall be known as "The Board of Trustees of the Industrial School," or Schools (the blank to be filled by the name of the municipality in which the said school or schools is or shall be located), which board of trustees shall consist of the mayor or other chief executive officer of the municipality in which said school is located, if there shall be a chief executive officer thereof, ex officio, together with five citizens of the municipality in which the said school is or shall be located, who shall be chosen as follows: The Commission on Industrial Education shall, within thirty days after the creation of any school or schools for industrial education in any municipality, under this act, where no such school or schools now exist, or in the case of any municipality where an industrial school or schools are under the act of the Legislature approved March twenty-fourth, eighteen hundred and eighty-one, and the amendments thereof and supplements thereto, now in existence, within thirty days after the passage of this act, nominate to the chief executive officer or body of the municipality in which the said school has been or shall be established, the names of three citizens of the said municipality for each vacancy on the said board, and the said executive officer or body of the said municipality shall select therefrom, in the first instance, the names of five citizens, at least three of whom shall be engaged in industrial pursuits, who shall compose the said board of trustees, who shall serve at the outset for one, two, three, four and five years, respectively, the terms of the respective members, in the first instance, to be designated by the appointing power, and thereafter upon the happening of any vacancy or the expiration of any term, the Commission on Industrial Education shall nominate to the executive officer or body of the municipality, upon the board of trustees of which the

said vacancy exists, the names of three citizens of the said municipality, from which the said executive officer or body shall choose one, who shall serve for the unexpired term only, if the vacancy occurs during a term, or otherwise for a full term of five years.

7. All moneys raised and contributed as aforesaid shall be applied, under the direction of the local boards of trustees, to the establishment and support of schools for the training and education of pupils in industrial pursuits, including agriculture, and the domestic arts, so as to enable them to perfect themselves in the several branches of industry.

8. Any municipality shall have power to appropriate and raise by tax, for the support of any such school therein, such sum of money as may be deemed expedient and just by the body or bodies of such municipality having power to appropriate money and levy taxes therefor, or for the partial support of any such school maintained in combination with another municipality or municipalities, as hereinafter provided for.

9. The members of local boards of trustees shall receive no compensation for their services.

10. All local boards of trustees provided for and organized under this act are hereby created bodies corporate, under the name and style of "The Board of Trustees of the Industrial School," or Schools (the blank to be filled by the name of the municipality in which the said school or schools shall be located), with the right of perpetual succession, to sue and be sued, to purchase, lease and hold personal and real property, and to sell and mortgage the same, and shall have power to accept donations and bequests of money and property to be used for the purpose for which the said boards are constituted and organized.

11. Any municipality may unite with any other municipality, or with more than one such municipality, for the purpose of maintaining a joint school or schools for industrial education, and in such case there shall be but one board of trustees for the combined district, the members of which shall be distributed among the municipalities combining for such purpose; and in event of such combination the presiding officer of the municipality where the school is located shall be, ex officio, a member of such local board of trustees.

12. Local boards of trustees shall have power to appoint a president, secretary, treasurer, and to expend moneys in accordance with the provisions of this act. They shall have power to approve bills for the necessary expenses for the conduct of the school or schools, shall determine whether or not tuition fees shall be charged, and the amount of the same, subject, however, to the approval of the Commission on Industrial Education. They shall report annually to the Commission on Industrial Education.

13. All local boards of trustees of schools for industrial education now existing under any previous law, shall be replaced by new boards of trustees, appointed in the manner provided for in this act.

14. The Commission on Industrial Education may, in its discretion, provide for lectures or courses of lectures to be given in the various sections of the State for the aid and encouragement of industrial education or the extension thereof, and may cause to be compiled texts and other printed matter for the use of the schools or courses coming under the provisions of this act. Courses of study and methods in schools coming under the provisions of this act shall be approved by the Commission on Industrial Education.

15. Any resident of any municipality of this State in which there is no industrial school as contemplated by this act, may attend any industrial school coming under the provisions of this act, located in any municipality other than that in which he resides, and the municipality in which such resident resides shall pay to the industrial school which such resident shall attend, such fee as may be fixed by the Commission on Industrial Education; and if any such school maintained in any such municipality has not the course of study desired by any such resident, such resident may attend an industrial school in some other municipality, and such municipality in which such resident lives shall pay for such tuition such fee as shall be fixed by the Commission on Industrial Education.

16. If any section of this act shall be declared unconstitutional, such declaration shall not be considered to affect the balance of the act.

17. The word "municipality" as used in this act shall include cities, towns, villages, boroughs and townships.

18. The Governor of this State be, and he hereby is, empowered to remove for any cause not religious or political, any member of any local board of trustees, and the vacancy occurring by reason of such removal shall be filled as heretofore provided for.

19. All acts and parts of acts inconsistent herewith are hereby repealed, and this act shall take effect immediately.

INDUSTRIAL EDUCATION—CONCLUSION.

It is the belief of the commission that for the State to make suitable provision for industrial education is to safeguard and promote the best interests of its entire citizenship; it is to furnish equality of opportunity to all; to put within the reach of everyone the means of making a worthy living—the foundation step towards living a worthy life; it is to make home life more pleasant, to broaden the horizon of youth, and to bring a fuller and richer meaning to the daily work of the artisan; it is to enhance the dignity of labor, to forestall poverty, and to substitute healthy creative impulses for criminal tendencies; it is to add to the permanence and stability of the whole industrial fabric, in this State of important and diversified industries. The attainment of these aims, in whole or in part, is worthy of personal effort and sacrifice, and mutual forbearance. It is the hope of the Commission that organized, constructive work may be undertaken, eventually to bring facilities for industrial training within the reach of all.

GEORGE R. HOWE, *President*,
 WILLIAM A. BEMBRIDGE,
 JOHN W. FERGUSON,
 F. W. ROEBLING, JR.,
 GEORGE G. TENNANT.

Attest—ALBERT A. SNOWDEN, *Secretary*.

Appendix A.

The Industries—Conditions and Needs.

No one is better qualified to set forth the requirements in the matter of industrial training than the employer of skilled labor. He is in daily touch with the practical problems. And the principal industrial schools of the State, at present, are the workshops, the factories, the farms. The instructors in these schools are the superintendents of the factories, and the foremen; the pupils are the apprentices—if, indeed, apprentices are to be found. In a great many shops no form of apprenticeship exists.

To the industries, then, the Commission turned, at the first, for a statement of the needs. If the essential points agreed upon in the communications from manufacturers and builders of the State were condensed into a single composite interview, the statement would include the following facts, in addition to what has been given in the body of the report:

“In considering the relative labor supply and demand, we should take into account a term of years—times of financial prosperity, as well as times of depression. Looking back, then, over the past five years, we would say that in nearly all branches of industry where skilled workmen are employed there has been a scarcity of those well trained. There is always a demand for workers who are capable, and even in times of industrial depression we find it possible, in most cases, to retain those who are efficient. The unskilled, on the other hand, are the first to leave the shop, and the last to be employed when we are putting on an additional force.

“The dearth of skilled workmen is due to a number of causes. Apprenticeship no longer finds favor with the average beginner in the industries. We have great difficulty in maintaining an apprenticeship system, and many of us have concluded that under

the present conditions it is not desirable to attempt it. When we take on apprentices, and spend time and money in their training, they are likely to leave us after a few months because they have found situations where they are paid journeymen's wages. And too often they prefer the higher immediate wage that is paid for routine work to the certain benefit which would come, eventually, from a thorough apprenticeship training.

"We cannot afford to pay our apprentices high wages, for their instruction is expensive for us. During the first year, the apprentice is apt to spoil more work in the shop than his services amount to. In order to give him an all-round training, we are obliged to change him frequently from one kind of work to another, whereas it would certainly be more profitable for us to employ him at piece-work, or in the performance of a single well-learned operation.

"Some of us have tried the 'back-pay' form of indenture for the purpose of encouraging our apprentices to remain for their period of service. That is, we contract to give a bonus upon the successful completion of the apprenticeship period, the accumulated fund amounting to from fifty to one hundred and twenty-five dollars. But even this plan has not always been successful in inducing boys to finish out their time.

"The constant tendency of modern industry to become specialized is another cause of the dearth of skilled workmen. In some of the factories, the average worker no longer deems it essential to be qualified in more than one branch of the industry. When we require capable foremen or superintendents, however, we find difficulty in getting men with experience broad enough to equip them for the position. Hence the growing conviction that some supplemental form of instruction must be devised. Machine operatives might thus be benefited, as well as craftsmen. And it would raise the standard of industrial intelligence if the specialists in the shops might have a certain amount of general training.

"In former years skilled workmen sufficient for our purposes came from foreign countries. To-day this condition no longer obtains. The continental workman is able, at present, to find employment at home at a wage that is entirely satisfactory for him, in view of his low living expenses and congenial surroundings.

"A very practical type of industrial training is demanded. Instructors should usually be chosen from among those who are experienced in the every-day activities of the line for which training is required. This plan should work well in the case of evening industrial improvement schools. The courses of study suited to the several industries must be developed, and vocational textbooks of elementary grade should be written."

The investigation of conditions in the industries was not limited to employers, but was extended to the workmen and their various organizations. The interest in industrial improvement schools was nowhere more manifest than in the case of the workers. An illustration of this attitude, as exhibited before the Commission took up the problem of investigation, is found in the movement started in Paterson, a little more than two years ago, to establish an industrial school for the building trades. (This was not carried to a successful issue, owing to the panic of 1907.) The proposition, then, was for the unions representing the various branches of the trades to join with the employers' associations, secure aid from the State (under the law of 1881), and establish and support an industrial school where the apprentice and the journeyman as well might receive the supplemental education necessary for their work. The scheme met with hearty approval of both the unions and the employers. The national organizations of some of the unions authorized the local bodies to appropriate money from their treasuries for the maintenance of such a school. This was a very clear illustration of the favor with which the right type of industrial education will be received by the union workman. The fact was also brought out that the older men, who have been working at their trade for years, are as desirous of taking advantage of such instruction as are the apprentices.

Every workman who is desirous of improving his condition has only to understand the benefits to be derived from industrial education, to have it meet with his hearty approval.

Appendix B.

The Agricultural Industry—Conditions and Needs.

BY DR. EDWARD B. VOORHEES, DIRECTOR OF THE NEW JERSEY
AGRICULTURAL EXPERIMENT STATIONS.

FARMING AN INDUSTRY.

Farming differs from all other occupations in many ways; it is truly an industry and in nearly all countries, more especially in the United States, the largest from the standpoint of number of persons engaged in it and the capital involved. It more than any other is a basic industry, contributing in great measure to the success of other lines of endeavor, not only furnishing the raw material, but providing larger quantities of goods for transportation than any other in the United States. The products of the farm exceed those of the mines, forests and rivers, which are derived directly from the natural resources of our country.

FARMING A PROFESSION.

Farming may be also regarded as a profession, because from the educational standpoint it has to do with all of the natural sciences. The proper knowledge of the growth of plants and their conversion into various other living forms requires the study of all the sciences and their various applications. It has to do with geology, chemistry, botany, physics, physiology, zoölogy, entomology, mycology—in fact with all phases of matter, both in its origin and use.

FARMING A MANUFACTURING BUSINESS.

Farming is also in a large sense a manufacturing business; the farmer is directing the natural agencies, and in using the necessary tools, machinery and mechanical appliances, is manufacturing annually millions of tons of raw material, ninety-five per cent. of the total weight of which is derived from intangible sources. In other words, he is a creative manufacturer, constructing from separate elements definite compounds. He is also a manufacturer in the sense that he takes the raw materials so derived from the air, water and soil, and converts them first into living animals, and then changes their crude products into concentrated forms, as butter and cheese.

THE NEED OF EDUCATION.

In all this, the success of the farmer is measured both by his knowledge of the relations of the natural agencies and their effect in the production and change of form into which his products are converted, and his skill in directing and performing the necessary labor. As an industrial class, farmers, more than any other, need to know much, not only of the fundamental principles involved, but they must possess such a training of the mind and the hand as will enable them to economically make the things they sell, and to have such business knowledge as will enable them to correctly discern the lines of profit. The importance that is now attached to the conservation of our natural resources as they exist in our soils is in a large measure due to the fact that the farmer has been ignorant of the relation of his practice to such conservation, and the result has been a wasteful and extravagant use of those elements which are the basis of such resources. The important relation that farming bears to the success of all other industries emphasizes the very great need, not only, but the very great necessity at this time of generous provision for the education of the farmer and his children. It will not only mean much to the industry, but it will mean much to the whole people, as having a bearing upon the future prosperity of all the people of any country, for no country is making genuine progress whose pro-

gress is not based either upon the agriculture of such country or of its dependencies.

VOCATIONAL STUDIES NOT TAUGHT.

Until recent years, no attempts were made to instruct the farmer or the farmer's child along the lines of his vocation; neither the common or the high schools of this country have been planned with any idea of giving instruction that shall increase the efficiency of the child or man as a worker, and unfortunately the rural districts have not yet in any marked degree met the requirements of what are regarded as a good common school education, irrespective of vocation. The field practice followed by the majority of farmers to-day is based largely upon tradition, and similar practices exist under a very wide variety of conditions. In other words, the business, as a whole, is still one without logical and reasonable basis, and the wonder is not that many farmers do not succeed, but that they succeed at all.

PRESENT OPPORTUNITIES FOR EDUCATION.

The opportunities for education to-day, while much superior to those of fifty years ago, are still inadequate to meet the requirements of the present, if the State or nation is to utilize their fields to the best advantage. Farmers have, however, always realized the need of definite guides, and through their activity have succeeded in having established organizations of their own, as well as State and national institutions which have for their purpose the study of the industry and the distribution of information. For the benefit of the farmer who is already in the field, there are societies, local and national, State and county boards of agriculture, farmers' institutes, and agricultural experiment stations, whose purposes are to organize, to teach, to experiment and to demonstrate. These institutions have proved their value and are growing in usefulness. They are, however, limited in their capacity as teachers. It was believed for a long time that for future generations the need was for agricultural colleges, and the magnificent institutions now established in the United States

are the result of such belief. Still, the real need to the farmer and to the cause of agriculture is the establishment of schools which shall give help to those now engaged in farming, and which shall train the young, now growing up on the farm; colleges serving mainly to supply the needed teachers and investigators. To meet the need for the young men and women on the farm, short courses in agriculture in the various State colleges and universities have been established, which meet the present demands in an admirable way for the few who can afford the time and expense of the courses.

SUGGESTIONS AS TO TYPE OF SCHOOL.

All of these means of education have, however, been of the greatest service so far as their sphere of influence extends, and it is because of the improvements which they have caused that great encouragement is given for future effort and for the formation of such plans as shall make it possible to reach not only the farmer in actual service, but also for the child attending the school, so that the work may be generally helpful and apply everywhere. The ideal conditions would be to provide what is needed in the way of education for all who are now engaged in the work, as well as for those who contemplate taking it up at some future time. Schools planned along the lines of the short courses in agriculture would meet the requirements, provided sufficient funds were available to teach all phases of the question. This would necessitate a large number of subjects, as there are so many special lines based upon the foundation principles.

WHAT THE SCHOOLS MUST TEACH.

Schools to meet the requirements as we see them to-day, should be prepared to give three distinct kinds of instruction—First, theoretical, in which the fundamental principles involved in the subject as a science are taught. This work should include the origin, composition and classification of soils; the characteristics and classification of plants; the rotation, harvesting and utiliza-

tion of crops; the composition and use of manures; the purchase and use of fertilizers and soil amendments; breeds and breeding of farm animals; injurious insects and their destruction; diseases of plants, etc.

Second, technical courses, or the application of principles in special lines of practice, which should cover market gardening, fruit growing, floriculture, greenhouse management, farm mechanics (tools and machinery), farm buildings, drainage and ventilation; dairy farming, butter and cheese making; stock farming; special grain farming and domestic economy.

Third, demonstration work, which should include fields for practice, in which the instruction given may be actually applied.

It will be observed from this general classification that the equipment of the schools must be both inanimate and animate; the first consisting of laboratories for the study of soils, manures, fertilizers, milk and its products; fields for growing demonstration crops and the crops themselves; shops for the making, handling, repairing and study of tools, machinery, engines, sprayers, etc., and various classes and breeds of live stock.

Schools of this sort should be under the general supervision of those directly interested in these phases of education, and competent to determine the educational values of the various means of instruction.

That educational work conducted along this line does help the farmer already engaged in his life-work, as well as the children and young men and women on the farm preparing for their vocation, has been abundantly demonstrated by the results already secured in this and other countries. The demonstration work of the Experiment Station in this State has resulted in changing the entire character of the farming in many communities. This has been accomplished by showing farmers that certain crops can be grown on their soils to better advantage than others, and that the special treatment recommended by the Experiment Station is better than that which they were following. Such special industries as the growing of the white potato, sweet potato, asparagus, and fruit, have been made profitable.

Along with this increased prosperity has come the legitimate desire for the conveniences, and, in many cases, luxuries, which

recent discoveries and the present development in mechanical lines and in transportation have made possible, which contribute so much to the farmer's comfort and self-respect. It has resulted in the improvement of communication by means of telephones, trolleys, good roads, all of which, besides making the farm a more attractive place to live, contribute to the wealth of the State.

The work of the short courses in agriculture, so recently established in this State, has already shown that instruction along these lines is possible and practicable. The young men receive not only an incentive and inspiration, but acquire that very important characteristic, the "how" to do things.

Extension teaching here and elsewhere, where traveling teachers go from farm to farm, giving instruction both in methods of farm practice and in the technique of the making of butter and cheese, and in the use of spraying mixtures and of machinery, has resulted in the forward movement of the industry.

In response to some further inquiries the following communication was addressed by Dr. Voorhees to the Secretary of the Commission:

As to the statistics you wish, I may say that for about fifteen years previous to last year, all of the students taking the scientific course in the college received instruction in agriculture, which was given the first term of the freshman year; the classes averaging about fifty men. In the regular four-year course in agriculture, about two men in each class have, on the average, taken the course.

Last year, the curriculum of the college was revised, new courses established, and the agricultural course made more of a feature. The lectures on agriculture to the entire class were then abandoned; under this new arrangement all freshmen take a uniform course and elect their special course at the end of the first year. This year ten men have elected the agricultural course.

In the short courses in agriculture, which were first offered in January, 1907, we have had about forty students each year.

The school is prepared to take care of a much larger number of students, but until this year we have not made a great effort to obtain students, because we were in process of organization; the appropriations for buildings and equipment were distributed over a period of three years. The equipment is now practically completed, and we are advertising much more liberally. I am sending you, herewith, a circular in regard to these courses.

Farmers' institutes have been conducted for the past fifteen years, and I have personally been in every county in the State and have attended a very large number of institutes, and other members of the staff have also taken part in the work. It cannot be said, however, that it is a college or experiment station matter, as the institutes are conducted under the auspices of the State Board of Agriculture, which receives a direct appropriation from the State for the work. I have, however, always exercised a careful supervision of the work, more particularly in the selection of speakers, in order that it might be as far as possible really educational.

The work has grown in interest from year to year, and while it is difficult to estimate closely the number in attendance, probably the annual average attendance would not be far from 1,500. I hardly think that, because of the indefiniteness of these figures, they could be safely put in tabular form, though you may so arrange them if you prefer.

In addition to this work, we have in the past made a special point of extension lecturing to farmers' clubs. I have in mind a club that was formed some years ago at Allenwood, Monmouth county, and I delivered four lectures a year (Saturday afternoons) before this club. The result of this work is very pronounced in its effect upon the farming community from which the members came; so much so that farmers living in other sections of the State have remarked to me the great improvement in the farming in these sections, judging merely from riding on trains. The membership of this club probably averaged about fifty.

The Short Course School should be prepared to take care of four hundred boys, as I am sure that about twenty boys from

each county would attend the school if the importance of the work were properly placed before them.

I think, also, that it would be possible with a proper extension of our institute work to reach at least one-half our farmers, say 15,000 or 20,000.

Very truly yours,

E. B. VOORHEES.

equally good. And in every case the per capita expenditure of these State schools would be greatly reduced if the schools could

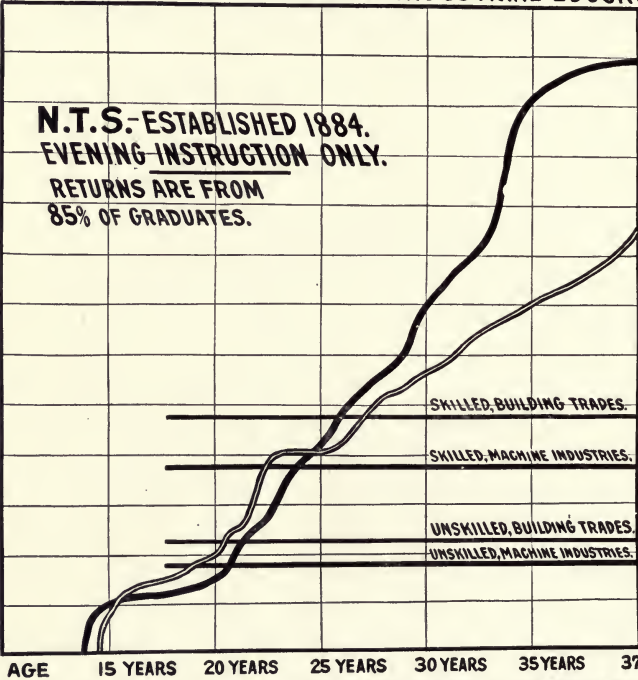
THE MONEY VALUE OF INDUSTRIAL TRAINING.

COMPILED BY N.J. COMMISSION ON INDUSTRIAL EDUCATION.

SALARY PER WEEK

\$60
\$55
\$50
\$45
\$40
\$35
\$30
\$25
\$20
\$15
\$10
\$5

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EVENING INSTRUCTION ONLY.
RETURNS ARE FROM
85% OF GRADUATES.**



AT AGE OF 45,
GRADUATES
IN MACHINE
INDUSTRIES
AVERAGE
\$66 PER WEEK

AVERAGE
WEEKLY WAGE
(ALL AGES)
OF THOSE
WITHOUT TECHNICAL
TRAINING
FROM STATISTICS
OF THE U.S. BUREAU
OF COMMERCE AND LABOR

AGE 15 YEARS 20 YEARS 25 YEARS 30 YEARS 35 YEARS 37 YEARS

— MACHINE
INDUSTRIES
== ALL CLASSES
OF GRADUATES.

**AVERAGE WEEKLY EARNINGS OF GRADUATES OF THE
NEWARK TECHNICAL SCHOOL.**
A STATE INSTITUTION OF SECONDARY GRADE.

Appendix C.

The Money Value of Industrial Training.

The great moral and cultural benefits of industrial training are readily conceded. Industrial education, as a financial investment, has not received its due meed of appreciation in public writings. If its wealth-creating, or purely economic value, were more widely understood there would be no hesitancy in the establishment of industrial schools. A very practical form of philanthropy is that which does good by making more useful citizens, and when the process is self-supporting there can be little excuse for inaction. It can be demonstrated that even to establish an expensive trade school, where the cost of maintenance might bring the expenditures per capita of attendance up to \$300 to \$1,000 per annum—as in the case of certain American trade schools (that of Milwaukee may be cited as one of the expensive type)—it can be shown that even such expenditures are a splendid investment, considered merely from the economic point of view. Certainly, there can be no quarrel with the type of industrial school which gives almost as good a direct financial return as the trade school, and at a yearly outlay of about one-twentieth the per capita cost of the trade school. Such a type of school is the industrial improvement school. The State industrial improvement school, known as the Newark Technical School, costs less to the Board of Trustees each year than \$42 per capita (expenditures are reckoned on full attendance, and all items of maintenance and estimated interest on investment are taken into account). The showing made by the State industrial improvement schools at Trenton and Hoboken (evening department) is equally good. And in every case the per capita expenditure of these State schools would be greatly reduced if the schools could

accommodate more pupils. The per capita cost of \$42 per annum is just about equal to the average weekly wage of the graduates of the Newark Technical School at the age of 37.

EARNINGS OF GRADUATES OF THE STATE SCHOOLS.

The Commission has conducted a very thorough investigation of the earnings of graduates and partial-time students of the State schools. In the case of the Trenton and Hoboken schools, it was difficult to get returns which would show the conditions for the majority of the students, but enough data were obtained to indicate that the status is quite similar to that at Newark. In the case of the Newark Technical School, it has been possible to keep more complete records of the graduates, and the Commission was enabled to get into touch with the majority. Eighty-five per cent. of those who have graduated since the establishment of the school filed statements of the individual earnings since entering upon apprenticeship, and made clear the wonderful increase in earning power which industrial training has given them. For instance, the average graduate of the Newark Technical School began apprenticeship at a wage which at the age of fourteen was \$3.55. His earnings at the age of thirty-seven were \$42.03 per week (this would be above \$45 if the earnings of all those who are not older than thirty-two were extended at the same ratio). On the accompanying chart this increase is shown graphically, and is compared with the average earnings of those who specialized in the machine trades, and with certain data obtained from the United States Government reports. The chart does not picture earnings beyond the age of thirty-seven, as in one branch not more than a score of individuals had gone beyond that age, and it seemed desirable that a sufficient number of cases should be averaged to make the results undebatable. Graduates in the machine trades began apprenticeship with a wage of \$3.76 per week at the age of fourteen, and at thirty-seven were making an average of \$57.17 per week. The average of the half dozen graduates in this line who have attained the age of forty-five is over \$66 per week.

So far as the fifteen per cent. of graduates are concerned who did not furnish a statement of earnings since apprenticeship, the Commission has made a careful estimate, and is satisfied that if these returns were in, the average would in no wise be lowered. The record as it stands means that the average graduate of the Newark Technical School is earning \$1,000 per annum more than he would have received if he had not attended the school. This is equivalent to placing \$25,000 in the bank at four per cent. interest. Or, it may be considered that every graduate of such school adds \$25,000 to the wealth of the State. In the machine industries the showing is still greater. In every case, during the course, earning was combined with learning, and instances are at hand where salaries were raised as soon as the employers heard that the workers were availing themselves of the opportunities of the school.

A few excerpts from letters received by the Commission from graduates of the Newark Technical School are given below. They are taken at random from a large pile of such correspondence, and show, better than any other expression could convey, what the graduates think of the school:

SOME STATEMENTS FROM GRADUATES.

"I attribute a large proportion of my success to training obtained in the school. My salary has increased probably 500 per cent. I unhesitatingly state that whatever advance I may have made above the rank of journeyman machinist has been due to the training and instruction I received at the Newark Technical School."

"I consider the N. T. S. the greatest factor in my success, as I could not have obtained the necessary education in any other way. I had to support my family, and therefore had no time except evenings, and no large sums of money to spend. Institutions like the N. T. S. are the thing for workingmen with the ambition to get on, if only they could see it and realize it better."

"I believe that a school modeled on the same general lines as the N. T. S. is the proper one for the generality of young men, and emphatically not a trade school."

"I entered the Newark Technical School to satisfy my ambition to 'get to the top of the ladder,' and am very much pleased with the results of those five years of hard work. Only those who have had to work ten hours in a shop and then spend from two to three hours an evening for five evenings each week, during seven months a year, know what it means to fight their own way in life's battles, and it is just such schools as the N. T. S. which help to bring out and develop the latent abilities which a young man has."

"I am most interested in the type of school which will give shop boys the theories of the work in which they are engaged, illustrated, if need be, by practical examples. The young workers are apt to gather erroneous theories in the shop, and they may not be in a position to gather any theories at all. Except for the training received in the Newark Technical School, I should never have been able to progress to my present standing." (This graduate earns \$58 per week.)

"Previous to entering Newark Technical School I had been studying mechanical engineering in a correspondence school, but came to the point where I needed the help of association with fellow-workers, and the direct assistance of experienced teachers. When I graduated from the Newark Technical School I had acquired a knowledge of things that has proven decidedly advantageous, and a training that could not have been gained in a lifetime of home study."

"I was compelled to leave school at an early age, and entered the Newark Technical School as the only means of acquiring a knowledge of mathematics, drawing and other subjects required by the machinist. The education received was of most decided benefit. Being the only apprentice in the shop attending an evening school, I was given better opportunities than the other boys. Within one year after completing my apprenticeship I was selected as foreman, which I feel confident was due more to my technical education than skill as a workman. At present my salary is undoubtedly at least \$20 per week more than I could earn had I not attended the Newark Technical School."

"When I went into business I was surprised to find myself with a technical education fully equal to that of the average tech-

nical man in the large automobile factories. I have worked my way to the front in the business, and wish at all times to give the school full credit for the indispensable technical knowledge and mind training, which, coupled with hard work, have placed me where I am now. I have twenty-five men in the factory. The N. T. S. entrance examination (about equal to that of a high school) is too hard for any one of them. They need a school of lower grade and shorter hours. I would be very much interested in the kind of school that would take any factory hand and teach him elementary mechanics without requiring the preliminary standard of education set by the better schools; in other words, a school for the many rather than for the few."

REPORTS FROM OTHER STATE SCHOOLS.

From former students of the State industrial improvement school, known as the Trenton School of Industrial Arts, came letters expressing an appreciation of its advantages, similar to the above. The returns from those who had attended the industrial department of the Hoboken School are also such as should greatly encourage those who are interested in the promotion of industrial education. A graduate of the Trenton School writes: "The influence of the S. I. A. has been felt keenly in our city. The instruction has benefited me greatly in every way, financial and otherwise." Another says: "At the School of Industrial Arts I stumbled upon the discovery, valuable to myself, that there is a large field in ceramic chemistry." Another: "I had almost decided to abandon the pottery trade, but on seeing the opportunities offered by the S. I. A. to learn chemistry, I concluded to make the pottery business my life-work. I am succeeding beyond my greatest expectations." Again, a former student writes: "It is inexplicable that a school which is doing such wonderful work as the S. I. A. should not at once receive funds for a new building, and for further expansion along useful lines. It has added a mint of money to the ratables of the State. It is one of the most valuable investments the State has made, but it is housed in a rat-trap of a building, which is certainly no credit to this prosperous commonwealth."

ECONOMIC IMPORTANCE OF INDUSTRIAL EDUCATION.

Several other institutions in the country have made interesting studies of the earnings of graduates, but it is safe to say that no such complete reports of the life-time earnings of graduates of an industrial school have been collected as those obtained by this Commission in the case of the Newark Technical School. The Lowell Institute School for Industrial Foremen, of Massachusetts, graduated its first class in 1905.* Two years later, the average increase of salary was seventy per cent. Other statistics tending to show the money value of industrial training are found in such individual reports as those of the Manhattan Trade School for Girls, and the Hebrew Technical School for Girls—both private foundations of New York City. But it is not necessary to go outside of the State of New Jersey for the most convincing proof of the economic importance of industrial education. The statement of von Mosthaf, of Stuttgart, is in point here. A famous academician of Berlin said to him, on one occasion: "This State is surely too poor to expend the money that you are demanding for industrial schools." "My dear sir," was the response, "the State is too poor not to expend the money."

Appendix D.

Industrial Education and Manual Training in America.

The aim of this supplementary chapter is to furnish a condensed summary of the provision, legislative and actual, for manual training and industrial education in the several States of the Union. In this connection brief reference has also been made to the provision for higher technical education, or the training of engineers, as it is found in the separate commonwealths. But the primary object of the chapter is to indicate, in a general way (necessarily restricted), what is being done in schools *below* the grade of the technical or engineering college. Wherever individual schools are mentioned, the information was usually obtained directly from the institution concerned, either by correspondence, or through the visits of the Secretary. Unless otherwise indicated, statistics given are generally for the year 1907-'08, though in many instances they are for the current year (1908-'09).

INTRODUCTION.

Federal Aid to Industrial Education.

Since the early days of the Republic the Federal Government has made vast grants of land and money to the individual States. Either by the conditions of the grants or through State initiative these gifts have been converted, in large part, into permanent endowments for the maintenance of the public schools, the State universities, normal schools, or other educational institutions. Moneys paid out of these funds to the public schools have been used for the maintenance of the various forms of instruction, in-

cluding manual training, domestic science and kindred branches. The university funds have gone to sustain agricultural or engineering instruction, as well as to promote the liberal arts. However, since 1862—the year when the Morrill Act was passed in aid of colleges of agriculture and the mechanic arts—whatever federal grants have been made to all States alike, have been chiefly intended for industrial-vocational education. In 1862 each State was granted 30,000 acres of land for each Senator and Representative in Congress from the State, for the establishment of one or more institutions (or departments), whose chief aim should be to teach agriculture, the mechanic arts, and cognate subjects. Over 10,320,000 acres have been allotted under this act. Of this acreage the land sold brought about \$13,000,000, and land valued at \$5,000,000 remains unsold. Other grants, of special character, were made when certain of the Western States were admitted to the Union. The State College (agriculture and mechanics) of Washington has reserved for future sale not only 89,000 acres of the 90,000 acres allotted under the act of 1862, but an additional 100,000 acres, none of which can be sold for less than \$10 per acre.

The following grants were made by the Federal Government to Oklahoma, when that State was admitted to the Union: Sections 16 and 36 in every township in Oklahoma Territory, for the common schools. In lieu of sections 16 and 36, and other lands of Indian Territory, \$5,000,000 in cash, for the common schools. Section 13 in the Cherokee Outlet, the Tonkawa Indian Reservation, and the Pawnee Indian Reservation, for the maintenance of the following institutions: The University of Oklahoma and the University Preparatory School, one-third; the normal schools, one-third; the Agricultural and Mechanical College and the Colored Agricultural and Normal University, one-third. Five per cent. of the proceeds of sales of public lands in the State to be set aside as a permanent fund for the common schools. Also, in lieu of lands for internal improvement and swamp-land grants, for the use of the University of Oklahoma, 250,000 acres; the University Preparatory School, 150,000 acres; the Agricultural and Mechanical College, 250,000 acres; the State Normal Schools, 300,000 acres; the Colored Agricultural

and Normal University, 100,000 acres. Also, minor grants, such as the gift of one section (640 acres) of land for the University Preparatory School.

The second Morrill Act, passed in 1890, appropriated to each State and Territory, for the land-grant colleges, \$15,000 for the year ending June 30, 1890, and thereafter an annual increase of \$1,000 for ten years, when the amount appropriated per twelve-month was \$25,000 to each State. The Nelson amendment, approved March 4, 1907, provided that, beginning with 1908, \$5,000 should be added annually to this appropriation until the same should reach \$50,000 annually (in 1912) for each State and territory. This money must be devoted to the "more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts," established under the act of 1862. The funds cannot be employed for the purchase of land or the erection of buildings, nor for the payment of the salaries of any but members of the faculties. Under the second Morrill Act, over \$20,000,000 has been contributed by the Federal Government for the support of the agricultural and mechanical colleges. Sixty-six institutions receive aid. In nearly a score of the States, departments or colleges—to become the recipients of the Morrill funds—were created in connection with the State universities; in the other States, separate and distinct colleges were organized, or else, as in a few cases, an arrangement similar to the following was effected: New York turned its fund over to Cornell University for the endowment and maintenance of a department; Massachusetts divided the funds between the Massachusetts Institute of Technology, at Boston, and the Massachusetts Agricultural College, at Amherst; New Jersey, which obtained 210,000 acres of land under the act of 1862, made the funds over to Rutgers Scientific School, a department of Rutgers College, at New Brunswick. In every instance the Federal Government left the specific disposition of the funds (under the general restrictions of the grants) to the Legislatures of the several States. In sixteen States and Territories, separate institutions for colored students were created or nominated by the respective Legislatures, to receive a share of the Federal grants. Of these, Hampton (a private foundation) is best known.

The United States Agricultural Experiment Stations.

By act of Congress of March 2, 1887 (the Hatch Act), each State and Territory received thereafter, annually, \$15,000, to be devoted to the establishment and maintenance of agricultural experiment stations. The Adams Act, of 1906, added \$5,000 to this annual appropriation, and provided that \$2,000 should be added annually thereafter until the total appropriation for experiment stations to each State and Territory should equal \$30,000 (in 1911). By 1905 the appropriations of the individual States to the experiment stations more than equalled that made by the Federal Government. In the case of the agricultural and mechanical colleges—to which the stations are usually adjoined—the States have been even more generous.

The acts of Congress relating to the United States Agricultural Experiment Stations provide:

“That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping, as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States and Territories.”

The Federal grant to the experiment station was \$1,290,220 for 1908.

All Grades of Industrial and Technical Education Aided by the Federal Grants.

Not only have the Federal grants been devoted, in part, to the sub-industrial, or sub-vocational branches, as manual training and domestic science—as noted above—and for the promotion of higher technical and scientific work in colleges (cp., also, the maintenance by the Federal Government of strong technical departments at Annapolis and West Point (and the lesser training schools for Army and Navy)), but the Federal educational grants have been and now are largely used for trade school work, industrial improvement schools and agricultural improvement schools (short courses) the most elementary of the strictly vocational work. The sixteen schools for negroes, which receive a share of the Federal grants for agriculture and the mechanic arts, have important trade school, industrial improvement and agricultural improvement divisions. The trades taught (in the trade school divisions) include: Carpentry, blacksmithing, wheelwrighting, shoemaking, brick masonry, stone masonry, broom-making, chair-bottoming, tailoring, millinery, cooking, laundering, printing, machine shop work, sewing, cabinet-making, stationary engineering, dressmaking, painting, tinsmithing, electrical work, plastering, paper hanging, upholstering, saddlery, harness making, sawmilling, plumbing, steam fitting, carriage trimming, frescoing, besides elementary horticulture, apiculture, dairying, poultry raising, animal husbandry, farming, gardening, housekeeping and nursing. In connection with the agricultural and mechanical colleges for whites (or in the corresponding university departments), the trades are often taught, either in affiliation with the preparatory departments, or, as in a few States (where the entrance requirements are low, or supplemental courses are offered), in the college itself. Work offered to special students is often of the industrial improvement school type (cp. the industrial improvement school maintained at Sparks by the Federal-grant-aided Nevada State University). As for the “short courses”—given in connection with quite all of the Morrill-aid schools—they are most successful in attracting students as

agricultural improvement schools ("short courses in agriculture"), although as day industrial improvement schools (*i. e.*, some of the "short courses in mechanic arts") they are also effective. Certain of the short courses are of high technical grade, but the great usefulness of this important type of training lies in its ability to reach the masses with the more elemental and strictly vocational instruction. Especially is this true of the agricultural branches, for the agricultural colleges, it is well known, have not succeeded in training a large percentage of farmers. In the college courses of the fifty Morrill schools for whites, for example, only one student in nine is enrolled in agriculture. There are over four students in mechanical engineering alone for every three in agriculture; four in civil engineering to every three in agriculture, not to mention other departments. The fact is that the country boys and girls drop out of the public schools early, just as the city children leave school permanently in large numbers during the fifth or sixth years of the course. The agricultural improvement school (short course) is to be their salvation, vocationally—and the counterpart of the industrial improvement school for the workers in the factory and shop industries and the building trades. But as yet, properly constructed textbooks are wanting in many departments of the "short course" educational field.

*Further Types of Vocational or Sub-Vocational Instruction
Given by the Land Grant Colleges.*

In the preparatory schools and university high schools under control of the boards having in charge the Morrill colleges, manual training and domestic science are subjects commonly found. Commercial branches (including such subjects as stenography and typewriting) are also taught, both in the preparatory departments and, in many instances, in the collegiate divisions. Instruction by correspondence is a feature recently introduced in the land-grant colleges, and is growing in favor. It is given with success by such schools as the Pennsylvania State College (*cp. Pennsylvania*, below), by the Oklahoma Agricultural and Mechanical College (agricultural subjects), and by the similar,

Federal-endowed department of the University of Wisconsin (non-agricultural, as well as agricultural industries). The farmer's institute is another form of popular instruction conducted with great success by extension lecturers from the land-grant colleges. The introduction in several of the colleges, of courses designed for the training of teachers of industrial subjects (not merely the sub-industrial) is a comparatively recent movement, and much to be commended. The pedagogy of industrial education has a field distinctly separate from the pedagogy of manual training, not only because the purpose of industrial education is vocational, but because the students in industrial education courses are more mature individuals, in general, than pupils in manual training.

An extension of the system of Federal aid to industrial education in the direction of greatest present need—*i. e.*, the secondary instruction—is proposed by the Davis bill, now before Congress. Under the head of secondary schools it would provide not only for Federal support to manual training and domestic science in high schools, but also for the similar endowment of industrial and agricultural improvement schools (evening or day). State normal schools would receive Federal aid for the training of teachers of manual training, domestic science, and the elements of agriculture—just as the land-grant colleges now receive Federal aid which may be devoted to departments for the training of teachers of industrial education. The total amount to be appropriated annually, under the terms of the proposed bill, is something over \$11,000,000.

Co-operative Demonstration Work.

(With acknowledgments to Dr. Knapp.)

Under authority of Congress, the Farmers' Co-operative Demonstration Work (conducted by the Department of Agriculture through the Bureau of Plant Industry) was inaugurated in January, 1904, primarily because of the depredations of the Mexican cotton boll weevil of the State of Texas. The work is in two divisions, (1) the demonstration of improved methods

of agriculture in the weevil-infected districts, which is the natural outgrowth of the original plan, (2) the extension of the same principles to other Southern States beyond the range of weevil infestation.

The territory covered by the division of the work includes eastern and northern Texas, southern Arkansas, Oklahoma, Louisiana and a portion of Mississippi. The total area thus covered is more than 300,000 square miles.

The second division of the work was commenced in Mississippi in March, 1906. In co-operation with the General Education Board this work in 1907 was conducted, in a limited way, in Alabama and Virginia, and has recently been extended into North Carolina, South Carolina and Georgia. The expenses of this division are defrayed by the General Education Board, which appropriated the sum of \$69,000 for demonstration work during the year commencing October 1, 1907.

Dr. S. A. Knapp is the special government agent in charge of the Co-operative Demonstration Work. A corps of field agents, classified according to the territory in charge, as State, district and county agents, is employed. The simple and well-established principles of successful farming are taught directly to the men on the farms. Great success has been attained in reaching the small farmers throughout the South, and by choosing as instructors natives of the States in which they work, the farmers are interested more readily in better conditions. At the present time 178 men are in the field, covering territory from Virginia to western Texas. The work is supported by Congressional appropriations in the territory where the Mexican boll weevil is present, but from Mississippi east, it is supported by the General Education Board. About 12,000 demonstration farms had been established up to February 1, 1908, and 20,000 farmers had agreed to co-operate and make reports as to results. "A demonstration farm" is a portion of land on a farm that is worked strictly according to the instructions of the department. If possible, the agent visits the farm at least once a month. A "co-operator" is a farmer who agrees to work a part or all of his crop according to instructions, but a department agent visits him only in exceptional cases. The department inaugurates its work at

first through public meetings, in which the farmers become interested in the plan. In the practical work, the cotton culture system is the main feature in many localities, but corn culture, the use of soil renovating crops, and the production of good farm seeds, are the subjects of lectures and demonstration in other districts.

Appropriations for the year 1907-'08 were as follows: Congressional appropriations, \$77,739.80; General Education Board contribution, \$69,000; Slater Fund, \$1,000; voluntary local contributions (estimated), \$20,000.

Nearly three thousand public meetings are held annually. Two hundred thousand circulars are distributed each year. These bulletins are also furnished to about two thousand county newspapers, which often publish them in full. It is estimated that at least 360,000 farmers visit the demonstration farms annually. Thousands of prize contests have been started in cotton and corn production among farmers, and also among boys on the farms. Great interest is everywhere manifested in better preparation of the soil, implanting selected seed, and in general betterment.

Resume of the Educational Activities of the United States Department of Agriculture.

The United States Department of Agriculture has more to do with vocational instruction in this country than any other Federal agency. Its Office of Experiment Stations is in constant relation with the agricultural colleges and experiment stations now in operation in all the States and Territories (the Federal appropriations to the land-grant colleges are paid through the Department of the Interior), and directly manages the experiment stations in Alaska, Hawaii, Porto Rico and Guam. It has an important work in carrying on investigations, and in the collection and dissemination of information. Over 7,000,000 farmers' bulletins alone, are sent out annually. The co-operative demonstration work of the Bureau of Plant Industry has been referred to above. The Forest Service of the Department of Agriculture conducts extension lectures in co-operation with some of the colleges and

universities. Likewise, the Office of Public Roads does extension work in the methods of road-making.

The United States Department of Commerce and Labor, and Its Relation to Education.

Thus far, the United States Department of Commerce and Labor has not taken as active an interest in industrial education as the importance of the non-agricultural industries would warrant. Except for the publication of reports concerning industrial schools (easily the most comprehensive of any such documents hitherto printed by a Federal department of the United States), the Department of Commerce and Labor has not yet taken up industrial education with the vigor of similar departments abroad, or in a manner comparable to the efforts of the Department of Agriculture (in relation to the agricultural industry). The investigation of the "industrial, social, moral, educational, and physical condition of women and child workers in the United States," conducted by this department will doubtless have considerable bearing on the problems of industrial education. The appropriation for this inquiry and report was \$150,000 (awarded in 1907).

The United States Department of War.

The War Department has charge of the great technical school at West Point, besides several training schools of lesser importance. Proof of the efficiency of the War Department in the domain of technical education is found in the successful conduct of the Panama Canal operations and important construction work in the way of river and harbor improvements, all of which are under the supervision of this department. The school system of the Philippines is also under the control of the War Department, and especial attention has been paid to industrial training in connection therewith.

The Department of the Navy.

The Navy Department has charge of the Naval Academy (with considerable technical work), at Annapolis, and superintends many other schools for the training of officers and enlisted men.

The Treasury Department.

The Treasury Department maintains courses of instruction for the cadets of the Revenue-Cutter Service.

The Department of Justice.

Under this department, the Reform School of the District of Columbia—affording some industrial training—is listed.

The Department of the Interior.

The most important work in industrial education that is performed under the auspices of the Secretary of the Interior is that of the Indian schools—under the Commissioner of Indian Affairs. Industrial and manual training in the Indian schools may be briefly summed up as follows:

Indian schools are maintained as regular public schools (sharing in State funds), as private schools (nearly all of these are mission, or denominational schools—some of them with contracts from the government), or as government (Federal schools). The government schools are of three (perhaps four) classes: (1) Non-reservation boarding schools (Carlisle, Pa., and Haskell Institute, at Lawrence, Kan., are the chief examples); (2) reservation boarding schools (that at Fort Totten, N. Dak., is the largest); (3) government day schools; (4) Hampton Institute—a private corporation, receiving Federal aid. The schools not controlled or aided by the Federal Government do the least, on the whole, in the way of industrial or manual training. The government day schools do something in manual training instruction, and the reservation boarding schools sometimes offer trade courses. The highest type of industrial work is found at the Hampton (Va.) and Carlisle (Pa.—non-reservation) schools. Most successful, everywhere, has been the instruction in agriculture, and in cooking, sewing, and other household subjects, but native arts and crafts, weaving, pottery, lace-making, basketry, poultry raising, butter-making, laundering, printing, and bee

culture are branches often taught in the Indian schools. At Hampton (also for colored) a great variety of trades may be found. Carlisle (not far from Harrisburg, Pa.) has students in carpentry, blacksmithing, carriage and wagon making, coach painting and trimming, painting, plumbing and steam-fitting, tailoring, harness making, shoemaking, plastering, masonry, bricklaying and cementing, tinshop work, printing, photography, baking, cooking, agriculture, sewing, laundering, horticulture and greenhouse work, poultry raising, and dairying. The work is practical. The fifty boys in carpentry (from twelve to twenty-one years of age), for example, work on actual construction at the school, and on repairing; the tailoring students make uniforms for the school, also working clothes and civilian suits. A superintendent of Indian schools—under the Commissioner of Indian Affairs, Department of the Interior, Washington, D. C.—has general supervision of the governmental institutions. The schools are found in a score of the States and Territories. The annual appropriation of the Federal Government is nearly \$4,500,000.

The Commissioner of Education for Porto Rico reports to the Governor of the Island, who transmits the document to the Secretary of the Interior. The United States Commissioner of Education is an officer of the Department of the Interior. The Bureau of Education has no schools under its charge, except the schools for the natives of Alaska. In these, some manual work is given, and this feature is being extended. For some years the greater part of the entire annual appropriation for the Bureau of Education has gone toward the reindeer in Alaska—for the industrial betterment of the natives. The reports of the Bureau of Education are most important contributions to education.

State Support to Manual Training.

Very few States have provided maintenance from the State treasury specifically for manual training, although wherever State school funds are apportioned for general school purposes, a portion of such funds may be used to defray the expenses of instruction

in manual training and like branches. Under this arrangement there is indirect State support in nearly all of the commonwealths. New Jersey, Maryland, Virginia, Wisconsin and South Carolina are the only States furnishing direct State aid for manual training (in two other States similar provision recently was allowed to lapse through failure to make appropriations). New Jersey is most generous in its direct provision, \$85,000 having been appropriated for this purpose by the Legislature of 1908 (in addition to the \$20,000 appropriated for industrial education). Maryland comes next, with a yearly appropriation from the State treasury of something over one-half as much. Wisconsin and Virginia limit the yearly State appropriation to about one-half of that of Maryland. In South Carolina the annual expenditure is small. Several other States have passed limited appropriations for the introduction of manual training, with the proviso that the appropriation should go but once to a single school.

The New Jersey Manual Training Act admits of an annual payment from the State treasury of from \$250 to \$5,000 (equivalent to the local appropriation, within these limits) to any school district in the State. The money is used for manual training (not for industrial training), and under the law the use of it for manual training in elementary or in high schools is not differentiated. In Maryland, the payment on the part of the State is \$1,500 yearly to each school ("large graded or high school"), and only two such schools (one for white and one for colored) may be selected in each county. Twenty-one of the twenty-three counties in the State have taken advantage of the appropriation for white schools, and ten counties also have the State-aided manual training schools for colored. In Virginia, not to exceed twenty thousand dollars (annually) "shall be devoted to the establishments of departments of agriculture, domestic economy, and manual training in at least one high school in each congressional district of the State." In Wisconsin, the State aid for manual training is devoted to high schools—either with or without grades attached—and the maximum State appropriation to each is \$350 annually.

Mandatory Legislation.

The laws of no State in the Union require manual training to be taught in general in the public schools, although in South Carolina high schools receiving State funds must include manual training in the curriculum. Courses of study drawn up by the State departments of education usually include manual training, but these documents are suggestive, rather than mandatory. The teaching of agriculture in the public schools, on the other hand, is prescribed by State law in Alabama, Georgia, Maine, Maryland ("in the discretion of the State board"), Mississippi (the branches of study in which teachers are required to be examined—agriculture is included—constitute the curriculum of the free public schools), North Carolina, Oklahoma, South Carolina and Wisconsin. It is prescribed by the State Course of Study of Louisiana (mandatory, so far as enforced). Several States which have not made instruction in agriculture compulsory in the public schools, require that prospective teachers shall be examined in agriculture, for certification. There is constant improvement, but it goes without saying that the States which have made agricultural instruction compulsory in the public schools have not succeeded in enforcing the provision everywhere, because of the lack of trained instructors, and the difficulty of carrying out the law to the letter in the poorly supervised rural schools. Also, there is the lack of time in the rural elementary schools, with many subjects and classes for each teacher. The "consolidated," or township schools, do better in respect of this instruction than the smaller, district schools. That very little may be expected, *vocationally*, of agricultural instruction in the elementary schools, under ordinary conditions, the experience of foreign States has demonstrated, as also it has shown that little, *vocationally*, may be looked for from the instruction in agricultural high schools, unless the latter institutions give up their mission as general preparatory schools—in other words, cease to be high schools in the usual meaning of the term. At present, the *vocational* secondary school for the agricultural and kindred industries is the "short course" (agricultural improvement school). The ordinary agricultural high school bears the same relation to the agricultural

industry that the manual training high school bears to the non-agricultural industries—it is not vocational.

The most complete requirement as to sub-vocational instruction is found in the laws of Oklahoma. In part, it is as follows:

“The elementary principles of agriculture, horticulture, animal husbandry, stock feeding, forestry, building country roads, and domestic science, including the elements of economics, shall be embraced in the branches taught in all the public schools of this State receiving any part of their support from this State, and these branches shall be as thoroughly studied and taught by observation, practical exercises, and the use of text and reference books, and in the same manner as are other like required branches in said public schools.”

State Legislation Concerning Industrial Education.

New Jersey, in 1881, and Massachusetts, in 1906, enacted provisions for systems of State-aided public industrial schools (to include agriculture), under management separate from that of the ordinary public schools. In both States the outcome has been very successful. New Jersey established the first State industrial improvement school in 1885. Massachusetts has accomplished splendid results in the introduction of the new schools, through its State Commission on Industrial Education, which has charge of the propaganda, and supervises the institutions. The national awakening to the need for industrial training has been brought about during the past few years only, and is chiefly due to the facts made known by the Douglas (State) Commission on Industrial Education, of Massachusetts. New York is the third (and the only other) State to have provided (1908) for a system of industrial schools for all branches of industry that may be reached through secondary training. The schools are to be separate from the ordinary schools, in organization, but under the supervision of the local boards, and of the State Department of Education, which, in New York, has unique powers. The experiment will doubtless be advanced to the point that some schools will receive State aid in 1909-10. A measure for the creation of a State commission on industrial education, to investigate local

conditions and take note of the European experience, is now before the New York Legislature.

The Connecticut law, of 1907, providing for a State-aided system of *trade* schools, was likewise enacted without a thorough-going preliminary investigation—hence is unsatisfactory, and no schools have been established under it. The Wisconsin law, of 1907, was passed in order to permit the Milwaukee School Board to take over a private *trade* school, and no progress has been made under it in other towns. It does not provide for State aid, but authorizes a local tax (not to exceed one-half mill on assessed valuation).

District and County Agricultural Schools, and Agricultural High Schools.

In Georgia and Alabama, a State-aided district agricultural school is provided for each Congressional district. In Oklahoma, the Supreme Court judicial district is taken as the territorial unit for the establishment of these institutions. The thriving district agricultural schools of Georgia may be classed under the head of industrial schools, whereas the district agricultural schools of Alabama partake more of the character of agricultural high schools, hence are more academic in their tendencies. However, it is found to be possible for the agricultural high schools to conduct vocational short courses, either alone or in co-operation with the agricultural and mechanical colleges. Under the terms of the enactment creating them, the district agricultural schools of Oklahoma tend to be agricultural high schools, since the law requires "a district agricultural school of secondary grade for instruction in agriculture and mechanics and allied branches and domestic science and economics, *with courses of instruction leading to the Agricultural and Mechanical College and the State Normals,*" to be established in each of the Supreme Court judicial districts (there are five such districts in the State). At least two such schools are to be organized every two years—beginning July 1, 1908—until all the districts are supplied. Eighty acres of land must be deeded (locally) in perpetuity, for each school, and without cost to the State. The district agricultural

schools of Oklahoma are under the control and supervision of the State Commission for Agricultural and Industrial Education. The Georgia schools are under separate and independent boards, appointed by the Governor of the State.

Wisconsin was the first State to found county "schools of agriculture and domestic economy"—since projected in Michigan, Minnesota and other States. Hon. L. D. Harvey, whose influence for the improvement of educational conditions is worthy of especial note, was the commissioner who recommended the plan for Wisconsin. At Wausau, Marathon county established the first, opened in 1902. At the outset the State aid was one-half the annual maintenance, but not to exceed \$2,500 yearly to each of the two schools authorized. The law was soon amended so that the State aid should be two-thirds of the annual cost of maintenance, but not to exceed \$4,000 per annum from the State treasury to each institution. The number of schools authorized has been increased, gradually, to eight. Four of these are in active operation—at Menomonie, Dunn county; Wausau, Marathon county; Marinette, Marinette county, and Winneconne, Winnebago county. A fifth, located at Onalaska, La Crosse county, will be opened next September. Each of the schools receives a maximum appropriation allowed by the State. (For further information and a specimen course of study, see paragraph headed "Wisconsin," below). The Beaverhead County High School, at Dillon, Montana, presents an interesting illustration of a somewhat different type of institution. Here, as is usual in the county agricultural high schools, a four-years' course in agriculture replaces the shorter course of the Wisconsin county schools, and the entrance requirements are more rigid.

Of the agricultural high school in general, it may be said: (1) The masses of individuals in rural communities drop out of the elementary schools before they reach the standard required for admission to it, and (2) whenever further education, along vocational lines, is required by such individuals, the shorter course institution is the one which more nearly suits the needs of the majority.

Industrial Improvement Schools.

As the type of school which inevitably must reach the greater number of those who are to have industrial-vocational training, the industrial school has thrived, during the past few years, as no other variety of institution for industrial instruction. The expansion of the industrial improvement schools will eventually make it possible, also, for the courses to be organized and differentiated to meet the new demands. That is, when industrial drawing is taught, the instructor must have in mind the specific industry or occupation for which preparation is required, and the students must be grouped by trades; the mathematics must be organized for each trade, so far as possible, and similarly in the case of other subjects. Moreover, the instruction must be brought within the grasp of any and all who have passed beyond the compulsory attendance age of the public schools, no matter what the previous training has been. Suitable texts, and properly trained instructors are needed, and since the demand on the part of those at work in the industries is insistent, doubtless they will be provided, eventually.

Under the term "industrial improvement schools" the "agricultural improvement schools" might be included—since agriculture is an important industry—but the types are so distinct and separate that the designation "agricultural improvement school" is employed with reference to the rural industries, for greater clearness. The agricultural improvement schools of the country have been mentioned, briefly, in the foregoing pages. The industrial improvement schools of America are typified by the evening work of the New Jersey State Industrial Improvement Schools at Newark, Trenton and Hoboken; by the Franklin Union, of Boston; by the Mechanics' Institute, of New York City; by the evening courses given under the auspices of Sheffield Scientific School (Yale University) to the workingmen of New Haven, Connecticut; by the similar courses conducted at Sparks, Nevada, by the University of Nevada; by the instruction given, in day or evening courses of one to three hours' duration, to the apprentices (and sometimes older employes) of sev-

eral railroads, and to the workers in several manufacturing establishments, and by the purely industrial courses (omitting all trade courses, such as practical plumbing, bricklaying, etc.), conducted in many cities by the Young Men's Christian Associations, and, in some instances, by the Young Women's Christian Association. Furthermore, such institutions as Pratt Institute, of Brooklyn, and Cooper Union, in Manhattan (New York City), are, to a large extent, industrial improvement schools, although Pratt Institute, for instance, has a variety of other departments which are not at all of the industrial improvement order, such as trade-school divisions, purely academic departments, sections for the training of teachers, fine arts instruction, manual training and domestic science. Cooper Union, also, has very large sections which are not of the industrial improvement classification. The evening classes at Hampton, Tuskegee, and several other institutions for industrial training are entered more by those who take only the industrial improvement courses than by those who enroll for the trade courses.

The work of the Springfield (Mass.) Evening School of Trades entitles it to be called an industrial improvement school quite as much as a trade school (or, rather, it is an industrial school with a trade department and an industrial improvement section), since the number of individuals who go in solely for the industrial improvement work (*i. e.*, mechanical drawing, industrial mathematics, etc.) is about equal to the number in the trade-school sections (*i. e.*, plumbing, etc.). The same is true of several other institutions, which are termed "trade schools." Looseness in terminology is encouraged, likewise, when manual training high schools are designated "technical high" schools, or "mechanic arts" high schools, and sometimes even "industrial" high schools.

Trade Schools.

The trade school is typified by the New York Trade School, the Williamson Free School of Mechanical Trades, the principal trade schools of Winona Technical Institute, the Baron de Hirsch Trade School, the trade-school departments of the Fed-

eral-aided institutions for members of the colored race, sections of the Carlisle and Tuskegee Schools, the trade departments (printing, etc.) in some of the Christian Association buildings, the School of Printing of the North End Union, at Boston; sections of the Hebrew Technical School for Girls, departments of Lewis and Pratt Institutes, the Boston and Manhattan Trade School for Girls, the plumbing course in the New Jersey Industrial Improvement School, at Newark, and some evening courses given in connection with the schools of New York City. No trade schools have been established by the States, although State-aided schools (especially land-grant schools in the south) sometimes have trade departments. Municipalities have made very little progress in the establishment of trade schools, nor are they likely to move rapidly in this direction, if we may judge from the experience of the cities of Wisconsin, Massachusetts, New York and other States. The Industrial Improvement School, on the other hand, has already obtained a substantial foothold in nearly every State of the Union, and during the past five years it has made greater progress in America, far and away, than any other type of industrial school.

Mixed and Intermediate Types.

All important agencies for industrial training found in the United States are briefly noted below, under the heads of the several States. This results in the inclusion of a number of institutions of mixed types, like the Drexel Institute, and several other institutes (the Mechanics Institutes are wont to be Industrial Improvement Schools), the Hebrew Technical School for Girls, Cooper Union and the George, Jr., Republic. *Technica*, like the Massachusetts textile schools, are naturally included, and intermediate technological schools, as well as the higher engineering institutions.

Advance Pages.

A special report on manual training, domestic science, and kindred branches in State normal schools, to be issued later, under

the auspices of the Seminary in Industrial Educational of the School of Pedagogy, New York University, has been laid before the Commission, in substance, as has also the material to be incorporated into a description and analysis of the work of the Young Men's Christian Associations in the field of industrial education—to be published by the same agency. The former shows in detail the facilities afforded by the State normal schools for the training of teachers of the sub-industrial branches, and leaves no doubt that all well-equipped normal schools give particular attention to this work; the latter reports describe the interesting pioneering achievements of the associations in the province of industrial training. On the North American continent, up to the month of February, 1909, there were 14,965 students enrolled in the Young Men's Christian Association evening classes in mechanical and architectural drawing, design, industrial chemistry and physics, electricity, manual training for boys, engineering, automobile operation and construction, carpentry and pattern work, forging and tool making, machine shop practice, plan reading and estimating, plumbing and surveying, printing, jewelry design, navigation, shoe-pattern making, and other industrial branches. Seven hundred and thirty-one instructors are employed to teach these classes—which are mostly of the industrial improvement order, with a few trade courses. In New York city, the Young Men's Christian Association industrial education departments enrolled 946 students in the industrial improvement and trade divisions, as follows: mechanical drawing, 85; plan reading and estimating, 66; structural engineering, 25; preparatory engineering and drafting, 18; automobile school, 455; motor boating, 23; decorative design, 15; theory and practice of furnishing and decorating, 50; chemistry of fuels, paper making and leather making, 12; plumbing, 14; steam engineering, 19; textiles, 21; piano designing, 26; course for janitors and superintendents, 27; industrial design, 6; electricity, 65; sign painting and lettering, 5; ornamental iron drafting, 14. The general rule is to have not more than fifteen pupils for each instructor.

Correspondence Schools.

The past few years have witnessed a notable advance in the organization of correspondence courses in industrial branches by great private endowed institutions like the University of Chicago, by great State universities like that of Wisconsin, and by land grant colleges, such as the Oklahoma Agricultural and Mechanical College, at Stillwater, to say nothing of other types of schools. Although there is ever the opportunity for the diligent and adaptable student to get much of the instruction he needs through the medium of the correspondence school, the absence of the stimulating personal and social influence of the instructor and the class have proven stumbling blocks to many who have undertaken correspondence courses. This difficulty several of the newer schools are seeking to remove by sending instructors to meet some of the larger groups, occasionally, and the old-line correspondence schools are also adopting this plan to some extent.

The Cost of Instruction.

In the following pages, as elsewhere in the report, the cost of instruction is frequently mentioned. By this term, the annual cost per student (to the board of trustees) is meant, and unless otherwise specified, not only salaries of instructors and other maintenance is taken into account, but also the interest (at 4 per cent.) on the plant, with a similar reckoning for depreciation, in fact every item which would be considered by a thorough business man in relation to his own affairs. The cost of instruction has been obtained from the full data furnished by the institutions concerned, unless otherwise specified.

The Dropping-Out of School.

A very careful investigation conducted by the Commission in cities of the United States having manual training high schools (technical high schools, mechanic arts high schools, etc.) shows that the percentage of permanent withdrawals from the various

grades or classes of these institutions is considerably greater than the percentage of withdrawals from the ordinary high schools.

Abbreviations.

The abbreviations employed throughout the succeeding pages are to be interpreted as follows: L.=value of land; B.=value of building(s); M.=annual maintenance; F.=number in the faculty; S.=number of students enrolled; H. S.=high school; M. t.=manual training; Ent. req.=entrance requirements; Coed.=co-educational; Com.=commercial; Inst.=instruction.

ALABAMA.

Manual Training and Industrial Education.—No State provision, other than noted below. The larger cities and several of the smaller towns have introduced manual training.

Agriculture in Public Schools.—"Instruction shall be given in the elementary principles of agriculture, and said subject shall be taught as regularly as other branches are taught in said schools, by the use of a text-book in the hands of the pupil, and such instruction shall be given in all the public schools of the State." (Sec. 1747 of School Laws.)

District Agricultural Schools (cp. Georgia).—Alabama has an agricultural school in each of the nine congressional districts. The State appropriates \$4,500 annually for each institution. Small local appropriations also. These schools usually are connected with local high schools, and are attended chiefly by those from the neighborhood. Work is begun at what is commonly known as the seventh grade. About 1,600 students are enrolled in the nine schools. Average, five instructors per school M., something above \$100 per pupil annually. Schools located at Abbeville, Albertville, Athens, Blountsville, Evergreen, Hamilton, Jackson, Wetumpka and Sylacauga. Wetumpka statistics: M., State \$4,500; from general school fund \$2,800; from matriculations \$1,700. L. + B., \$55,000; E., \$5,000. S., in H. S. 108; in preparatory department, 192; special S., 32. Fees: grades

7 to 10, \$9 per year. H. S. course, four years. "We have our experiment station and demonstration farm in good working order. We have done something in domestic science, but lack of means is retarding this work. We want to introduce manual training as soon as we can see our way clear to do so." (President Leonard L. Vann, in a letter to the Commission.)

State Schools.—The State provides for the following institutions: (1) The University of Alabama, at University (F., 46; S., 471), offers engineering courses. (2) The Alabama Polytechnic Institute (State Agricultural and Mechanical College, for whites), at Auburn. F., 53; S., 565. (3) The Alabama Girls' Industrial School (for whites—not a reformatory), at Montevallo. F., 40; S., 319. Has \$400,000 invested in land and buildings. M., \$40,000. Usual course, 4 years. Entrance same as for H. S. English, scientific and classical courses. Forty-eight units in technical and eighty in literary departments required during four-years course. Four years of Latin in classical course, and two years in scientific course. "Technical units" to be selected from business subjects, or cooking, sewing, millinery, *freehand* or industrial drawing, and agriculture (for teachers). Board and fees, \$106 for entire session (September 16—May 18). (4) The Agricultural and Mechanical College for Negroes, at Normal (F., 40; S., 270) now receives \$4,000 annually from the State, and \$11,000 from the Federal Government (agricultural grants). Trades (16) are taught. Student labor was employed in construction of the Carnegie Library and several other buildings of the institution. (5) The Preparatory School of Mines of the University of Alabama (for whites), to be located at Tuscaloosa. (6) The State Normals at Troy, Florence and Jacksonville, for whites, and at Montgomery and Tuskegee (branch of the Institute), for negroes, have manual training departments, and in some cases include industrial courses. (7) The School for the Deaf, Dumb and Blind, at Talladega, and the Reformatory and Industrial School for Boys, at East Lake, also furnish manual instruction.

Private Foundations.—(1) (The Tuskegee Normal and Industrial Institute (for colored), at Tuskegee, enrolled 1,621 (1,085 male; 536 female) during the past year. Average attendance,

1,400. Also, 400 enrolled in the winter Short Course in Agriculture, and 144 children in the Training School. 38 states and foreign countries represented. Average age, 18½; none admitted under 14. 110 diplomas and industrial or trade certificates granted at close of year 1908. 166 instructors and helpers in school (all colored). Institution almost continuously in session. Non-sectarian. Endowment, \$1,513,440. Current expenses, 1907-'08, \$252,707. The State appropriates \$4,500 annually toward the normal training department. In 1899 Congress granted 25,000 acres of mineral lands to Tuskegee. Admission requirements: ability to read and write, and to do problems of arithmetic through division. Academic, military, normal and Bible training departments, school for nurses, numerous industrial and trades courses (for either sex), including practical agriculture and farm industries. Both day and night schools. Students may pay a portion of their expenses in labor. Cost of table board, \$1.19 per week. Since Tuskegee was founded in 1881, more than 6,000 men and women, who have finished a full or partial course, have been sent out from the Institute as teachers or industrial workers. (2) Smaller industrial schools (or schools offering industrial training) for members of the colored race are: (a) Kowaliga Institute (F., 11; S., 290), at Kowaliga; (b) Mt. Meigs Colored Industrial Institute (F., 7; S., 325), at Waugh; (c) Talladega College (F., 31; S., 600), Talladega; (d) Corona Industrial Institute (see below); (e) Stillman Institute (F., 2; S., 50), Tuscaloosa; (f) Snow Hill Normal and Industrial Institute (F., 20; S., 280), Snow Hill; (g) Calhoun Colored School (see below).

Corona Industrial Institute (for colored). In mining district. M., \$3,700 (county gives \$700). F., 10; S., 267. Day and night school. Industries for boys: mining, carpentry, wheelwrighting, blacksmithing, agriculture; for girls: plain sewing, dressmaking, cooking, truck gardening. Girls pay \$5 per month for board and \$1 per month for tuition; boys, \$6.50 and \$1.

Calhoun Colored School, Calhoun.—“A school and social settlement in the blackest cotton-belt county (Lowndes) of Alabama.” Blacks in county, 7 to every 1 white; in towns, 27 to 1. “A one-room cabin and crop-mortgage region.” S., 300, aver-

age. Fifty boarding students (32 of these work during day and attend night school). F., 7 white; 6 colored. Kindergarten and common school course. Also industrial, agriculture and domestic training.

Southern Industrial Institute (for whites), Camp Hill. F., 11. S., 100. M., \$9,000. Tuition, \$20 per year. Day and night school. Industries taught: agriculture, dairying, elementary forestry, saw-milling and carpentry, brickmaking, cooking, sewing and laundering. Students may work their way.

ARIZONA.

Agricultural Instruction and Industrial Schools.—The laws of the territory contain no important popular provisions in this regard.

"*Industrial Drawing* must be taught in all schools" (teachers?).

Manual Training and Domestic Science.—School districts may provide courses in these subjects, "provided, that such subjects can be pursued without excluding or neglecting the subjects previously provided for by law." Boards in districts having 200 children of school age may provide special teacher or teachers of manual training or domestic science. Courses in manual training or domestic science must be approved by Territorial Board of Education. This board issues special licenses to teachers of these subjects. In 1906-'07 five such certificates were issued; none during the year previous.

The University of Arizona (at Tucson) includes a College of Agriculture and Mechanical Arts (and an Agricultural Experiment Station). These receive the grants for agriculture from the Federal Government. It also has a School of Mines. University M.: from United States, \$59,000; State, \$33,000; student fees, etc., \$19,000. F., 44; S.: College, 70; Preparatory School, 167. Manual training and mechanical drawing are taught in the Preparatory School.

An Industrial Reform School is maintained by the Territory at Benson.

In Indian Schools industrial or manual training is given.

ARKANSAS.

Manual Training and Industrial Education.—Very little State legislation pertaining to these subjects has been enacted, except as given below. No State aid for these subjects in the common schools. Several cities have introduced manual training, nevertheless.

Agriculture in the Public Schools.—School directors are authorized to “cause to be used and taught, when in their judgment they see fit, an elementary text-book on the subject of agriculture in their respective districts in the common schools of this State. Said text-book to be used as a part of the course in reading, or as a supplementary reader.” (Act approved May 29th, 1907.)

The State University, at Fayetteville, receives eight-elevenths of the federal appropriations to the State for agriculture and the mechanic arts. It also has a United States Experiment Station. One thousand one hundred and fifty-five students were enrolled at Fayetteville in 1907-’08; also, 175 students were in the Medical School of the University (at Little Rock), 55 in the Law School (at Little Rock) and 340 in the Branch Normal College (for colored), at Pine Bluff. The Branch Normal College receives three-elevenths of the federal grants. Industrial training is given in this institution also.

Only recently has Arkansas begun to establish normal schools (offering manual training) for white students.

Private industrial institutes for members of the colored race are located at Cotton Plant, Little Rock and Pine Bluff.

Industrial training is a feature of the Deaf-Mute Institute, maintained by the State, at Little Rock.

CALIFORNIA.

Manual Training and Domestic Science in Public Schools.—“When competent teachers thereof can be secured and there are sufficient funds in the district to pay their salaries, manual training and domestic science must be taught.” (Par. in sec. 1665 of School Laws, enacted 1907.)

State Schools.—The University of California, at Berkeley, offers higher technical training (as does the privately-endowed Leland Stanford, Jr., University), and receives the federal appropriation for agriculture. The five State Normal Schools, at San José, Los Angeles, Chico, San Diego and San Francisco, furnish manual training courses. The State schools of a reformatory nature, at Whittier and Ione, give industrial training. Likewise, the Institution for the Deaf and Blind, at Berkeley. At San Luis Obispo is the *California Polytechnic School*, a secondary industrial school established by the State (Act of Legislature of 1901). cp. secondary State industrial schools of New Jersey, under law of 1881). "The purpose of the school is to furnish to young people of both sexes mental and manual training in the arts and sciences, including agriculture, mechanics, engineering (sic!), business methods, domestic economy and such other branches as will fit the student for the non-professional walks of life" (Act of 1901). Co-educational. Entrance requirements: Completion of grammar school (or equivalent). Minimum age, 15. Three courses, each three years in duration. S.: Agriculture, 39; mechanics, 66; household arts, 35; special, 1. Time about equally divided between classroom and shop. No tuition. Students pay for materials used. The State has expended \$396,000 upon this school (1901-1909). L. + B., \$150,000. Equipment, \$50,000. M. (1908), \$41,000. F., 16. Board of Trustees appointed by the Governor.

Private Foundations.—Throop Polytechnic Institute. Pasadena. Founded 1891, by Amos G. Throop. The Institute comprises three schools—college, normal school and academy. Co-ed. Entrance requirements: for college and normal school, H. S. graduation; for academy, grammar school graduation. Academy offers 4 years course, mainly elective, with wide choice of industrial or commercial as well as general subjects. Normal school gives 2 years course in (a) manual training for elementary schools; (b) for secondary schools; (c) domestic economy; (d) fine arts. Civil, mechanical and electrical engineering courses (4 years) offered in college department. Endowment, \$200,000. L. + B., \$175,000. Equipment, \$35,000. M., \$65,000. S.:

College, 36; Normal, 42; Academy, 256; Commercial, 22; Special, 51.

The Wilmerding School of Industrial Arts for Boys (founded by J. C. Wilmerding), and the *California School of Mechanical Arts* (founded by James Lick) are located on neighboring sites at San Francisco. The two institutions co-operate, the Director of the former being at the same time the Principal of the latter. The California School was opened in 1895, the Wilmerding School in 1900. C. S. is co-educational. The Lick School is devoted mainly to the machinery trades. Wilmerding School teaches the building trades. Students may work in both schools during the same term. Ordinarily eighth-grade graduation is required for admission to either. No tuition, but students pay for books, etc., and for actual cost of working materials. Courses in the California School are four years in length, comprising a preliminary manual training course of two years, merging into a trades or technical course of two years duration, to be chosen from the following: (1) Patternmaking; (2) Forge-work; (3) Molding; (4) Machine-shop Practice; (5) Machine Drawing; (6) Industrial Chemistry; (7) Industrial Art; (8) Domestic Science; (9) Dressmaking; (10) Millinery; (11) Preparatory for Technical College Course; (12) Polytechnic Course. S. in C. S.: girls, 125; boys, 375; F., 18. Self-perpetuating board of trustees. Endowment, \$540,000; L. + B., \$110,000; Equipment, \$40,000; M., \$33,000 (interest on investments, \$27,000; payments by students for materials, \$4,500; sales of manufactured articles, \$1,500). Wilmerding School is governed by a committee of the Regents of the University of California. Boys who have finished only the seventh grade are admitted if over 16 years of age. A four-years course. During the first two years time divided equally between shop and classroom. Apprenticeship may be begun at outset, or not later than at end of two years. Carpentry, plumbing, cabinetmaking, electrical work, bricklaying, blacksmithing, industrial art and architectural drawing are the subjects for specialization. Students graduate as journeymen. Student labor is employed in erection of new buildings. F., 13; S., 263. Endowment, \$400,000. L. + B., \$80,000. Equipment, \$20,000. Income: from investments,

\$25,000; from sales of manufactured articles, \$1,000. Mr. Geo. A. Merrill, the head of the above schools, writes the Commission: "It is a mistake to try to teach trades proper to boys just out of the grammar school."

Cogswell Polytechnical College, San Francisco.—This institution is of secondary grade, and not collegiate as the name suggests. Ent. req., completion of the eighth grade. Course, four years in duration. Co-ed. S., 220; F., 7. Endowment, \$1,500,000. B., \$125,000. L. (school site and playground), \$50,000. Equipment, \$30,000. M., \$25,000.

The Polytechnic College of Engineering, at Oakland, offers courses (two years, throughout the entire year) in engineering and architecture. Support is entirely from tuition fees. The school admits those who have completed the eighth grade of the public schools, and shortens the engineering courses by the omission of "modern languages and the so-called culture studies."

Manual Training Schools, under Boards of Education.

The Manual Training and Commercial H. S., of Oakland, was organized twelve years ago, and has grown steadily. Co-education. S., 160 in Manual Training Department and 342 in Commercial section. Grammar school preparation required for entrance. Commercial course, 2 years; manual training, 4 years. Tuition free to residents of Oakland. M., \$60.

The Polytechnic H. S., of San Francisco.—A 4-year course. Three hundred and fifty pupils enrolled. Building destroyed by fire in 1906. Will have new edifice.

The Anna S. C. Blake Manual Training School, of Santa Barbara. Established 1891 and deeded to city by founder 1899. Supported by special city tax. Two buildings, valued at \$10,000 and \$12,000, respectively. Equipment, \$4,000 + \$5,000. M. (1908-09), \$8,500. Tuition free to residents (non-residents, \$15 per year), except normal training course—\$100 per annum. Attendance compulsory for grade pupils. Sloyd and sewing, 4th grade to H. S.; cooking for 8th grade. Ungraded H. S. course. S., 1,070, mostly in elementary school.

Industrial Schools for Indian Children.—Indian Industrial School, Greenville; Hoopa Valley Indian School, Hoopa, and Sherman Institute, Riverside.

COLORADO.

State Schools.—*The University of Colorado*, at Boulder, has extensive facilities for higher technical instruction (engineering, S., 271). *The Colorado School of Mines*, at Golden, offers mining engineering. *The Colorado Agricultural College*, at Fort Collins, receives the federal grants. U. S. Experimental Station located here also. Four-year courses are given in agriculture, horticulture, mechanical and civil engineering, architecture and domestic science. The State Industrial School for Girls (Morrison), and the State Industrial School for Boys (Golden) are reform schools in which vocational training is given.

Indian Schools offering industrial courses are located at Breen and at Grand Junction.

Colorado College, at Colorado Springs, is a privately endowed, non-sectarian institution. S., 717, of whom 91 were in engineering courses, and 11 in forestry. Engineering courses, 4 years; forestry, 3 years. E., \$1,000,000; M., \$70,000; L., \$400,000; B. + equipment, \$796,950.

Manual Training.—No noteworthy provision in State laws. The Manual Training High School of Denver offers the usual four years' course. Twenty-three per cent. of the work is of the type indicated by the name of the institution. L. + B., \$205,000; M., \$48,000; equipment, \$20,000. Supported by taxation.

CONNECTICUT.

Industrial Education—Trade Schools.—By act of the Legislature, approved July 30th, 1907, any town or school district is authorized, with the approval of the State Board of Education, to establish a free trade school, open to any residents of the State except those under sixteen who have not completed the eighth grade. School districts may combine to establish a trade school. The State treasurer is authorized to repay to the school district annually a sum equivalent to one-half the total expenditure for maintenance, provided that the sum thus paid out by the State for trade schools shall not exceed \$50,000 per year. No schools

have been established. Secretary Hine, of the State Board of Education, writes: "The law is not satisfactory in any sense."

State Schools.—The Connecticut Agricultural College, at Storrs, receives the federal grants; also State appropriations. There is free tuition and free rent of rooms. The records of the graduates show that one-fourth of the total number have gone into farming, and nearly one-fourth into other industries—some of them allied to farming. The State Reform School for Girls, at Middletown, has an elaborate system of industrial training. Similarly, industrial work is given at the Connecticut School for Boys, at Meriden.

Higher Technical Instruction.—Given at Yale University (New Haven) and at Trinity College (Hartford). The latter has lately developed a "thoroughly equipped course in civil engineering (S., 71), and a somewhat less extensive plant for teaching electrical engineering (S., 15)." In the Sheffield Scientific School, of Yale University, the evening industrial improvement courses given to the workmen of the city, enroll six hundred individuals.

Manual Training.—The board of school visitors or town school committee may prescribe elementary science and training in the manual arts as part of the course in the public schools. The following towns have a rather extended course in manual training: Hartford (most excellently equipped), New Haven, New London, Bristol, Derby, Greenwich, South Manchester, Naugatuck, Vernon and Williamantic.

Hartford.—"In manual training proper we have a regular three years' course in constructive drawing, with an option of architecture or machine design in the third year. About 180 pupils are enrolled in this course. There are two courses in woodwork, both including wood-turning. The one we designate cabinet-making, and the other pattern-making. The latter also includes foundry practice. About fifty pupils can be handled in these classes, and we have more applicants than we can accommodate. In machine work we run a three-year course, and in these classes we carry from eighty to a hundred. One domestic science class for girls was opened this year for the first time, and its enrollment is about twenty" (William C. Holden). *New*

Haven.—Boardman Manual Training School is the manual branch of the New Haven High School, and supplements the academic work in the case of those who elect its courses. S., 725.

New London.—The Manual Training and Industrial School. A technical high school (fourth year of course will be in operation in 1909-10). "Not an industrial school, except for special students who come in for cooking, dressmaking and the like, and such students are not admitted unless they are attending the other high schools of the town." Supported by endowment (\$25,000, annual interest, \$1,000), by private donations (\$25,000 per year) and by city appropriations (\$3,000 per annum). L.+B., \$60,000; E., \$15,000; M., \$7,000; regular S. in m. t., 110; girls taking domestic science and domestic art only, 43; boys taking mechanical drawing and shop work only, 4.

Waterbury Industrial School.—Offers instruction in domestic science (hours, 3 P. M. to 9 P. M.) to pupils who may choose to come after finishing the day's work at the public schools. Small tuition. Course intermediate. Supported by voluntary contributions. L. + B., \$30,000. M., \$3,000. S., 450.

Watkinson Juvenile Asylum and Farm School, Hartford.—Furnishes home and instruction, while preparing for useful occupation, to homeless boys from 12 years of age upward. Gives courses in farming, horticulture, etc., and manual training (in Handicraft Schools). S., 35. End., \$270,000. L. + B., \$150,000. M., \$8,500. Fees: the majority of students free, others 50 cents to \$3.00 per week.

School of Horticulture of the Handicraft Schools of Hartford.—Maintained by private means. M., \$2,500. S.: Boys, from Watkinson Farm School, 33; from city schools, 75; adults (teachers), 7. Fees, \$5 to \$10 per garden, according to size.

Y. M. C. A. Trade School and Institute, Bridgeport. This year both day and night schools along the line of the General Electric Co.'s school at Lynn, Mass., are being conducted. M., \$1,157. *Hillyer Institute of Y. M. C. A.*, Hartford.—Is carrying on an interesting experiment, similar to the above.

Schools Within the Factory.—The Yale and Towne Manufacturing Company, at Stamford, and the Bullard Machine Tool Company, at Bridgeport, maintain successful apprenticeship schools.

DELAWARE.

Industrial Education, Manual Training, Agriculture in Public Schools.—Not specifically provided for in State laws.

State Schools.—Delaware College, at Newark. Established under the land grant act of 1862 (received 70,000 acres). United States Experiment Station. Four-year courses in mechanical and civil engineering, chemistry and general science. Also short courses in agriculture. S., 125. L. + B., \$150,000. *State College for Colored Students*, at Dover. Receives a portion of the federal appropriations made to Delaware for agriculture and mechanical arts. Is properly more a trade school than an agricultural college. Courses in agriculture, carpentry, machine-shop work, blacksmithing, printing, tailoring, sewing, cooking, laundering, nursing, millinery and military drill. L. + B., \$35,000. Equipment, \$3,600. S., 140. *The Delaware Industrial School for Girls* is a reform school located at Wilmington.

Private Foundations.—*St. Joseph's Industrial School for Colored Boys*, at Clayton, maintains about 75 individuals, taking them at age 12-14, and keeping them until 16-18, when positions are found. L. + B., \$75,000. M., \$20,000. *Y. M. C. A.*, Dover.—Has absorbed the school known as the Co-operative Draughting School.

DISTRICT OF COLUMBIA.

Manual Training.—Taught in the upper grades of the public elementary schools, and in the McKinley (for white) and the Armstrong (for colored) Manual Training High Schools. Both of the latter schools offer a "general scientific" course, and a "technical preparatory" course of four years duration, and a two-years course called "special technical. Optional subjects are chiefly in the third and fourth years. *McKinley*: L. + B., \$325,000; E., \$125,000; M., \$60,000; S., 723. Annual cost of instruction per pupil, \$70, not including interest on investment, the depreciation, etc. *Armstrong*: L. + B., \$140,000; E., \$60,000; M., \$30,000; S., 460. Cost of inst., \$67.40, same conditions as above. Manual training is given in the normal schools

of Washington and in the Industrial Home School (reform school) of the District of Columbia.

Maintained by the United States.—Gallaudet College and Harvard University (for colored), which receive federal aid, have no important bearing on the industrial vocations.

Private Foundations.—(1) George Washington University is the most important of the institutions giving higher technical training. In an entirely different class is (2) the Bliss Electrical School. A private enterprise. Gives a one-year course in electricity. Admission, "a common school education and a working knowledge of arithmetic." S., 175. (3) St. Rose's Industrial School gives elementary manual instruction.

FLORIDA.

Manual Training, Agriculture, in Public Schools.—The State law is merely permissive. These subjects "may be provided for in the county course of study." Very little has been done in this direction. No State provision for industrial education.

State Schools.—*The State University* (for male students), located at Gainesville, receives the agricultural grants of the Federal Government (except that part of the Morrill Fund devoted to the Colored Normal), and has a United States Agricultural Experiment Station. Judged by the appropriations (United States, \$52,500; State, \$15,000), this is more a Federal university than a State institution. Ent. req., 99/10 Carnegie units (the standard is 14). Regular course, four years; special courses, two and three years. Total S., 103 (including 31 sub-freshmen). L. + B., \$200,000; equipment, \$60,000; M., \$60,000 to \$70,000. *The Florida Female College.*—This institution has a "School of Industrial Arts" in which domestic science, etc. are taught (S., 75; total S., 215). *Florida School for Blind, Deaf and Dumb.*—Offers one trade: printing; also manual training. *The Florida State Normal and Industrial School* (for colored, at Tallahassee, receives a portion of the Morrill Fund. *The State Reform School* at Marianna.

Private Foundations.—*The John B. Stetson University*, at De Land (affiliated with the University of Chicago), has a "College

of Technology," and a preparatory academy in which industrial training is a part of the curriculum. *Rollins College*, at Winter Park, is a non-sectarian school which offers work in manual training and domestic science, and architectural and mechanical drawing. *Schools for the Colored Race*.—At Fessenden Academy, Jacksonville (Cookman Institute), and Orange Park (Normal and Manual Training School), forms of manual or industrial training are found.

GEORGIA.

Manual Training.—No State provision, but may be taught as a part of the regular school course.

Agriculture.—"The elementary principles of agriculture * * * shall be studied and taught (in the public schools) as thoroughly and in the same manner as other like branches" (Law of 1903).

District Agricultural Schools.—The State has provided for an agricultural school in each of the eleven congressional districts. "They are not under the jurisdiction of the State Department of Education." The boards of trustees for each school are appointed (one from each county of the district) by the Governor. The largest board is in the Second District, which comprises 18 counties. The schools are "supported by the 10c. fertilizer tag tax, also oil inspection taxes and pure food taxes." The income from the State treasury amounts to about \$7,000 annually for each school. Other things being equal, both the county and the town (in each district) offering the best inducements secured the location of the school. As an illustration of how this worked out, the gifts in the First District amounted to \$125,000; in the Second District, to \$95,000; and similarly in the other districts. The majority of the schools opened first in 1908, some of them for the spring term. Courses are generally of four years duration. Entrance requirements: Boys must be at least 14 years of age and girls 13. Pupils enter, in general, having about the preparation of a graduate of the sixth grade in the public schools, but the schools do not insist upon this standard in every instance. One advertises: "Pupils may enter regardless of literary ad-

vancement, especially if they are from 18 to 26 years of age, yet we would not advise any to make applications who are not fairly good readers, and who are not familiar with the fundamental rules of arithmetic."

Other State Schools.—The "University of Georgia" comprises (1) The University at Athens (including "State College of Agriculture and the Mechanic Arts"—offering engineering courses); (2) The North Georgia Agricultural College, at Dahlonega; (3) The Medical College, at Augusta; (4) The Georgia School of Technology, at Atlanta—an engineering and trade school; S., 562; L.+B., \$500,000; E., \$100,000; M., State \$60,000, city \$2,500, fees \$21,000; (5) The Georgia Normal and Industrial College, at Milledgeville (for girls); S., 483; business courses, sewing, dressmaking, millinery, industrial art and domestic science departments included in curriculum. This institution is succeeding remarkably well in its aim "to fit the young women of Georgia for proper home-making; (6) The State Normal School, at Athens (co-educational); (7) The Georgia Industrial College for Colored Youths, at College (near Savannah); S., 300; offers instruction in a variety of trades and industries.

Other Schools Offering Manual or Industrial Training.—(1) The Elementary School of Columbus. (2) The Secondary Industrial School of Columbus—opened December 10th, 1906—part of the regular school system. L.+B., \$65,000; E., \$35,000; S., commercial 40, domestic arts 11, mechanic arts 25, textile 13. City pays \$8,500 per year for support of school. Cost of instruction per pupil can hardly be reckoned at less than \$140 annually. (3) The Berry School, at Rome; (4) The Y. W. C. A. Schools at Atlanta, and (5) Rich's School, at Rabun Gap, are elementary in scope. (6) The Boys' High School, at Atlanta, offers extensive manual training courses. (7) *Negro Schools* are: (a) Spellman Seminary, Atlanta; (b) Knox Institute and Industrial School, Athens; Fort Valley High and Industrial School; Atlanta University; Savannah Negro School; Clarke University, Atlanta; Georgia Normal and Industrial Institute, Greensboro; Jeruel Academy, Athens; the Normal Training Institute, Albany; and the Normal and Industrial School, at Forsyth.

IDAHO.

Manual Training.—Taught in the State Normal Schools at Albion and Lewiston, and in the schools of Boise, Pocatello, Blackfoot, Idaho Falls, St. Anthony, Wallace, Payette, Moscow, Lewiston, Caldwell and Coeur D'Alene.

State Schools.—(1) *The University of Idaho*, at Moscow, has facilities for engineering courses, and embraces an agricultural department which secures the grants of the Federal Government. It has a preparatory school offering similar instruction of lower grade. (2) *The Academy of Idaho*, at Pocatello, is affiliated with the State University, and is under the administration of a board of trustees appointed by the Governor. The school has a trades department, as well as commercial and general. S., 200. Forty thousand acres of land were set apart by the State as endowment. (3) *Idaho Industrial Training School*, at St. Anthony. Reform school for boys and girls. Common school branches, manual training and some industrial work. Endowed with 50,000 acres of State land. (4) *The State School for the Deaf and Blind*. Organized in a school building of Boise by the State Board of Education.

Private Endowment.—The *Idaho Industrial Institute*, at Weiser, is a good illustration of a successful farm and trade school on a small scale. L. + B., \$100,000; E., \$10,000; S., 100. Entrance requirements nominal.

ILLINOIS.

Industrial Education.—No provision in State laws.

Manual Training.—Upon petition, a vote may be ordered in any high school district, and if majority of votes are in favor of establishing a manual training department in the high school, the same shall be organized. Manual training is found in the principal school districts of the State. Courses in manual training and domestic science are given in the State Normal Schools. The *Richard T. Crane Manual Training H. S.*, of Chicago, is one of the better institutions of its class in the State. It offers the usual

four years' course, and is a part of the Chicago public school system. L. + B., \$400,000; E., \$50,000; M., \$80,000; S., 1,141. The cost of instruction is put at \$80 per pupil in attendance, but this does not take into account the items of investment and depreciation of property. The new Albert G. Lane H. S., opened in Chicago in the autumn of 1908, is organized along similar lines. The Manual Training and Technical Departments of the High School of the University of Chicago are highly efficient. St. Mary's Manual Training School, Des Plaines, gives an extended course. The Jewish Training School of Chicago, 199 West 12th Place; the Chicago Industrial School for Girls, 49th and Prairie avenues, and the Illinois Industrial School for Girls, 79 Dearborn St., Chicago, are of elementary character.

State Schools.—The University of Illinois, at Urbana, furnishes extended courses in engineering, agriculture, horticulture and kindred subjects. It receives the federal grant. Has United States Agricultural Experiment Station; also engineering experiment station.

Private Foundations.—(1) The University of Chicago and James Milliken University, at Decatur, are the chief private university foundations giving higher technical instruction. (2) The Armour Institute of Technology, Chicago, furnishes all grades of industrial training. Its evening trades and industrial improvement courses were attended by over 700 pupils during 1908. Its "academy" is a technical institution of high school grade (S., 292), leading to the "college" (S., 616), where higher engineering subjects are taught. The six weeks summer classes enrolled 216. L. + B., \$3,500,000; E., \$375,000; M., \$200,000, contributed chiefly by the Armours. Evening classes, 10 weeks per term, 3 terms yearly; fees, \$10 per study. Academy fees for both sexes. Instruction in (a) Mechanical Engineering; (b) Mechanical Arts; (c) Domestic Economy; (d) the Liberal Arts. Degree of M. E. obtained by four years of college work; title of Associate in Arts, two years in college work; and Academy Certificate, four years in academy. Evening industrial improvement, trades and business courses (S. in evening, 1,299; day students, 1,303). Endowment, \$1,000,000; L. + B., \$500,000; E., \$200,000; M., \$120,000. The Institute is at present conducting

an interesting experiment—a modification of the “Cincinnati Co-operative Plan”—a two-years course in the mechanic arts, fifty weeks work and two weeks vacation per year. Twenty-four weeks will be spent in the school and twenty-six in the shop of the employer. Students are arranged in two groups, alternating week by week between the shops and the Institute. Age of students in the co-operative plan, from 16 to 20. The employer is expected to pay five dollars a week for the time actually spent in the shop and tuition amounting to \$50 a year for each boy. The school section of the course is worked out along the lines of (1) physical science and the principles of mechanics; (2) machine sketching and mechanical drawing; (3) such shop work as will best supplement the work which the boys are doing when not in school; (4) English, history and mathematics. (4) *The Bradley Polytechnic Institute*, Peoria—Graduates of eighth grade of public schools admitted to Lower Academy; also has higher departments and facilities for instruction of unclassified students. Courses in manual training, domestic science, industrial subjects, and training of teachers for the foregoing. Also general instruction. The Horological School (watchmaking, jewelry, engraving and optics), a department of Bradley Institute, is a purely trade school, and is thoroughly equipped. The Institute is affiliated with the University of Chicago. Endowment, \$2,000,000; L. + B., \$250,000; E., \$50,000; M., \$65,000. S.: watchmaking, 280; arts and sciences, 426; summer school, 98. Cost of instruction per pupil, \$125 annually. (5) Industrial improvement courses and some experimental trades instruction are to be found in the Y. M. C. A. of Chicago, and of some of the principal cities of the State. The Illinois “College” of Photography and the Bissell “College” of Photo-Engraving, Chicago, the Coyne Brothers schools (building trades), the Chicago Correspondence Schools and the McDowell School of Dress-making are conducted as private enterprises.

Schools Within the Factory.—At their Chicago shops the International Harvester Company and the Western Electric Company maintain evening and day classes for their apprentices.

INDIANA.

Manual Training.—Tax rate of five cents on each one hundred dollars of property liable for taxation for school purposes may be levied locally by cities of 100,000 population, or over, for the manual or industrial training departments which may be established. Cities of 50,000 to 100,000 population may levy a tax of ten cents on every one hundred dollars of ratables for similar purposes. Manual training has been introduced generally in the cities and in many "consolidated" rural schools. The Manual Training H. S. of Indianapolis and those of Ft. Wayne and Evansville are especially noteworthy. Anderson has just completed a similar institution.

State Schools.—(1) Indiana has two State universities—Indiana University, at Bloomington, and Purdue University, at Lafayette. The former has no engineering department; the latter receives the federal grants, and has built up strong courses in the various engineering branches. (2) The Soldiers' and Sailors' Orphans' Home, at Knightstown, affords elementary industrial instruction, as does (3) The Indiana Boys' School (State Reform School), at Plainfield.

Private Foundations.—(1) Rose Polytechnic Institute, at Terre Haute, "is a school for the higher education of young men, especially for the professions of mechanical, electrical and civil engineering, architecture and chemistry." Entrance requirements: Completion of first-class high school course. Course, four years. Has a shop for wood and iron work. Tuition, \$75; incidental fees, \$25. E., \$547,000; L. + B., \$170,000; E., \$215,000; M., \$45,000. Annual cost of instruction per pupil, \$186 (not including investment calculations). S., 229. (2) Winona Technical Institute, Indianapolis.—Made up of practical trade schools. Instruction given in iron molding, tile and mantel setting, carpentry and house-building, electricity, mechanical drawing, civil engineering, machinery, house painting, decorative and sign painting, library work, lithography, printing, pharmacy and chemistry. Other departments are being added. The Institute is supported by six national associations, by private subscriptions

and fees. L. + B., \$750,000; E., \$350,000; M., \$100,000. S., in pharmacy and chemistry, 100; in printing, 25; molding, 30; bricklaying, 10; lithography, 40; tile-setting, 5. Total, 210. Cost of trades instruction per pupil can hardly be figured at less than \$500 annually, after tuition fees are deducted. Course in tile-setting, six months; in painting and bricklaying, one year; the others, two years. Entrance req.: From completion of grammar school to second year of H. S. (3) Notre Dame University, at Notre Dame, offers higher technical instruction, and Earlham College, Richmond, gives a course in civil engineering. (4) Industrial training is offered by the Y. M. C. A. at Indianapolis and elsewhere. (5) The Interlaken School, near La Porte, is a manual training boarding school for boys between the ages of nine and eighteen. It has been established on the model of the European rural educational homes. Tuition, \$400-\$600. (6) Valparaiso University, at Valparaiso, has a considerable number of industrial courses. S., 5,367.

IOWA.

Industrial Education and Manual Training.—There is nothing in the State laws touching these matters specifically. The school boards have the authority to prescribe courses of study, and many of the larger school systems are introducing manual training. The State Normal School at Cedar Falls has manual training and domestic science courses. The Des Moines High School has 200 pupils in manual training. Public schools of the State may hold farm or trade expositions monthly (exhibiting articles made by students or crops raised by them).

State Schools.—(1) The State University (S., 2,315), at Iowa City, offers the full list of engineering courses. (2) The Iowa State College of Agriculture and Mechanics Arts (S., 1,331), at Ames, received 204,000 acres of land under the Morrill Act of 1862, and has been granted the federal annuities. (3) The State Industrial School for Boys, Aldora, and the State Industrial School for Girls, Mitchellville, are reform schools in which manual work is taught.

KANSAS.

Industrial Education and Manual Training.—The board of education in any city of the first or second class may levy a tax not to exceed one-half mill upon every dollar of assessed valuation for equipment and maintenance of industrial training schools, or industrial training departments of public schools, and annual school meeting of any other school district may levy one mill tax for similar purposes—the causes to be approved by the State Board. Under Session Laws of 1903, districts successful in provision for manual training might receive State aid up to \$250 each, but appropriation of State was allowed to lapse, and this State aid will no longer be available unless the Legislature again authorizes appropriations. Nearly thirty cities and towns (including county high schools) offer manual training. The High School of Kansas City, Kansas, has made noteworthy provision.

State Schools.—(1) The University of Kansas, at Lawrence, and (2) the Kansas State Agricultural College (Manhattan) offer engineering courses, and the latter institution admits of an extensive election under the head of agriculture. (3) The State Manual Training Normal School (est. 1903), at Pittsburg (cp. the North Dakota State Normal and Industrial School, Ellendale—est. 1899 as the “State Manual Training School”), like the Western State Normal School (at Hays), is a branch of the Kansas State Normal School at Emporia. The Pittsburg Normal School (S. 498) is designed to train teachers of manual training, domestic science and kindred subjects. Students may be admitted after eighth-grade graduation, upon completion of the high school course. Life diplomas courses, “with manual training,” or “with art manual training,” are of four years’ duration. Academic courses are also listed, singly and in combination with manual or industrial work. Pattern-making and molding, sheet-metal work, plumbing and steam-fitting, cabinet-making and mill construction and machine shop work are special lines of industrial training scheduled. Commercial courses, primary and kindergarten methods are also included in the offer-

ings. (4) Western University (for colored), at Quindaro, is under State control, through the appointment by the Governor of the majority of its trustees, and receives legislative appropriations for its industrial department. Architecture, mechanical drawing, industrial arts and science, including manual training, domestic science and art and agriculture, are comprised in the courses. Similarly controlled and aided by the State is (5) The Topeka Industrial and Educational Institute, on the plan of Tuskegee, with instruction in the trades and agriculture. (6) The School for the Deaf, at Olathe, and (7) the School for the Blind, at Kansas City, are State institutions affording manual instruction, as do also (8) the Boys' Industrial School (Topeka), and (9) the Girls' Industrial School (Beloit)—State reform schools.

Private Foundations.—The schools for colored students, mentioned in the preceding paragraph, are private foundations, though state-controlled. Other colleges throughout the State do very little in the way of technical training for the industries. Distinct industrial schools are only the Santa Fe Apprenticed Schools at Topeka, Newton, and Arkansas City (several branches in other States), and the Telegraph Schools of the same system, at Topeka and Newton (branch at Los Angeles, Cal.). The announcement of the latter schools (entitled "A Live Wire") is an attractive and artistic presentation of the case. The Santa Fe Apprentice Schools furnish instruction two hours a day, two days a week. The apprentices are taught mechanical and freehand drawing, shop arithmetic, and the elements of mechanics. (Write F. W. Thomas, Supervisor of Apprentices, Topeka, for detailed information.)

KENTUCKY.

Industrial Education and Manual Training.—The laws of the State do not provide for payments to any school or district in aid of these subjects. The Louisville Manual Training High School is the only considerable institution of its kind in the State (investment, L. + B. + Equipment=\$175,000). It was presented to the city (1892) by Mr. A. V. du Pont. The terms of gift stated

that the school should be "free to all white boys in the city qualified to enter the male high school, and not under thirteen years of age," and "no special trade shall be taught in said school, nor any articles manufactured therein for sale." Lexington, Covington, Winchester, Frankfort, and other large municipalities of the State furnish manual training, in its simplest forms, to boys and girls in the public schools.

State Schools.—(1) The State University, at Lexington, until recently styled the "Kentucky Agricultural and Mechanical College," gives courses in engineering and agriculture. It receives the federal grants, of which fifteen per cent. goes to the Kentucky Normal and Industrial Institute for Colored Persons, at Frankfort. The latter institution offers some trades instruction. (2) The State normal schools have established manual training courses. (3) Similar departments are found in the reform schools, and the State School for Defectives.

Private Foundations.—(1) The Kentucky Women's Christian Temperance Union established (1902) a social settlement and school at Hindman. The institution grades from kindergarten up into the high school. Woodwork, sewing, cooking, basketry and school gardening are taught. L. + B., \$25,000; M., \$5,000; S., 250. The Eckstein Norton Institute (for colored), at Cane Spring, furnishes instruction in dressmaking and plain sewing, cooking, printing, shoemaking, painting, carpentry, barbering, laundering, and farming. L. + B., \$2,500; M., \$4,000; S., 94.

LOUISIANA.

Manual Training and Industrial Education.—Manual training is included in the State course of study for elementary schools (suggestive; merely). It is taught in the State Normal School at Natchitoches, and in such city schools as those of Shreveport. The State Schools at Ruston and Lafayette (see below) were designed to furnish industrial education, but owing to local conditions these institutions have hitherto been conducted more as manual training schools.

State Schools.—"Louisiana State University and Agricultural and Mechanical College," at Baton Rouge, offers agricultural

and engineering courses (including "sugar engineering"). It receives part of the federal grants, United States Experiment Station. (2) Southwestern University and A. and M. College, New Orleans, was established by the State, under the constitution "for the education of persons of color." The school shares in the federal grants. It has an important trade school department. Total S., 400. (3) Louisiana Industrial Institute, at Ruston, "for the education of the white children of Louisiana in the arts and sciences, at which such children may acquire a thorough academic and literary education, together with the knowledge of kindergarten instruction, telegraphy, stenography, and photography; of drawing, painting, designing, and engraving, in their industrial applications; also a knowledge of fancy, practical and general needlework; also a knowledge of bookkeeping, and of agricultural and mechanical art, together with such other practical industries as from time to time may be suggested by experience or such as will tend to promote the general object of said institute, to wit, fitting and preparing such children, male and female, for the practical industries of the age" (Act of 1894). The school is under a board of trustees appointed by the Governor, the latter and the State Superintendent of Public Education being ex-officio members. Boys must be sixteen years of age, and girls fifteen, for entrance. In practice, grammar school graduation is expected. The course of the institute is of five years duration. S., 600; L. + B., \$350,000; E., \$30,000; M., \$51,000. Cost of instruction per pupil, \$85 annually. (4) Southwestern Louisiana Industrial Institute, Lafayette, is of more elementary type—entrance on completion of seventh grade; course, one to four years. L. + B., \$150,000; E., \$15,000; M., \$20,000; S., 300. Cost of instruction, \$50 per pupil, annually. (5) The State Institute for the Deaf and Dumb (Baton Rouge) and (6) Louisiana Institute for the Blind (Baton Rouge) are institutions affording elementary manual instruction.

Private Foundations.—(1) Isidore Newman Manual Training School, New Orleans, has 360 white pupils enrolled, classed as follows: Kindergarten, 40; elementary school, 242; high school, 78. It is a tuition school (\$60 to \$100 per year). L. + B., \$75,000; E., \$15,000; M., \$25,000. (2) For colored pupils,

Gilbert Academy and Industrial College, at Baldwin; the Peabody State Normal and Industrial School, at Alexandria, and Leland, New Orleans and Straight "Universities," at New Orleans, furnish a certain amount of trades instruction and of manual training.

MAINE.

Manual Training and Industrial Education.—No noteworthy State provision. Manual training may be adopted by cities or towns as part of the regular school course. Several cities of the State have efficient departments of manual training and domestic science, notably Bangor, Bath, Lewiston, Portland and Westbrook. Manual training was introduced into all the State Normal Schools at the beginning of the school year 1907-'08. "Any city or town may annually make provision for free instruction in industrial or mechanical drawing to persons over fifteen years of age, either in day or evening schools, under direction of the Superintending School Committee" (Section 23, School Laws). Under certain conditions academies may receive State aid, and are then required to provide a course in manual training, domestic science or agriculture, approved by the State Superintendent.

Agriculture in Public Schools.—The State law contains no direct provision for instruction in agriculture. Candidates for teachers' certificates are examined in the common branches "and the elements of the natural sciences especially as applied to agriculture" (Paragraph 11, Section 36, School Laws). "The course of study in the free high schools shall embrace the ordinary English academic studies which are taught in secondary schools, especially the natural sciences in their application to mechanics, manufacturers and agriculture" (Section 59, School Laws).

State Schools.—(1) The University of Maine, at Orono, gets the federal appropriations for agriculture. It includes in its organization the College of Agriculture and the College of Technology. Late in 1907 the University organized a four-years college course of study in elementary agriculture for teachers. S., 874. L. + B., \$500,000; E., \$250,000; M., \$150,000. (2)

The Industrial School for Girls (Hallowell) and the State School for Boys (Portland) are reform schools furnishing manual instruction.

MARYLAND.

Manual Training.—(1) Maryland stands next below New Jersey in the amount appropriated from the State treasury for manual training, \$46,500 annually, to 31 schools (21 for white, 10 for colored—one of each kind may be established in each county), each receiving \$1,500. Buildings are provided locally. Average daily attendance must be at least 30. Separate schools for colored. (2) The Baltimore Polytechnic H. S. is a manual training institution of high rank, giving the usual four-years course. L. + B., \$100,500; E., \$26,000.

Industrial Education.—No State provision except as noted below.

State Schools.—Maryland Agriculture College (S., 240), at College Park (near Washington), was the second institution of its kind to be organized (Agricultural College of Michigan opened first). It receives 80 per cent. of the federal grants for agriculture. A similar institution (branch) for the education of colored students, located at Princess Anne, obtains 20 per cent. of the federal aid. (2) The State normal schools provide instruction in manual training, domestic science and like branches. (3) Industrial training is given in the reform schools.

National Schools.—The United States Naval Academy, at Annapolis, affords technical training to the students (midshipmen) appointed by the President or by Senators or Representatives. Examinations. Age, 16–20. Pay, \$600 per year. Course, four years, with an added two years at sea. (Write the Chief of the Bureau of Navigation, Navy Department, Washington, D. C., for further information.) (2) *The United States Service School of Instruction*, at Arundel Cove, is intended for the education of cadets for the United States Revenue Cutter Service.

Other Schools.—(1) *Maryland Institute for the Promotion of the Mechanic Arts* (Baltimore) admits students at the age of 14.

Day and evening courses. Subjects: Art (decorative, illustrative, etc.), mechanics, architecture, design, modeling, sculpture. Receives State and municipal funds. L. + B., \$475,000; E., \$25,000; M., \$45,000. Day pupils, 619; evening students, 1,024. (2) *McDonough School*, at McDonough (12 miles northwest of Baltimore), was the outcome of a private bequest. Board of trustees created by the city of Baltimore. Accommodates about 150 individuals annually—"poor boys of good character, of respectable associations in life, residents of the city of Baltimore, * * * between ten and fourteen years of age * * * must pass a competitive examination." Property of the foundation valued at about \$1,000,000. Industrial work given to about eighty boys (woodworking, 40; iron, 20; printing, 20), commencing with the last grade of the grammar school. "We find that working with wood is a better training than working with iron, where so much of the work is done by machines more or less automatic."—S. T. Moreland). (3) *The Laurel Agricultural and Industrial Institute*, at Laurel, is an institution for colored students. It emulates Tuskegee. Trades are taught, comprising industries for both sexes. Students from age 12 upwards. Attendance small but growing.

Commission on Industrial Education.—A State Commission on Industrial Education has been appointed by Governor Crothers, under the provisions of Chapter 367 of the acts of 1908, to investigate and report to the Legislature at its next session (in 1910) respecting the subject of industrial education. Three hundred dollars were appropriated for the expenses of the inquiry. The Commission consists of the following: Dr. Richard Grady, Annapolis (Chairman); Carroll Edgar, Elkton; Howard Melvil, Denton; John T. Foley, Baltimore; Lorie C. Quinn, Crisfield.

MASSACHUSETTS.

Manual Training.—No direct State aid. "The elements of the natural sciences, kindergarten training, manual training, agriculture, sewing, cooking * * * and such other subjects as the school committee consider expedient, may be taught in the

public schools" (School Laws). "Every city and town containing twenty thousand inhabitants, or more, shall maintain the teaching of manual training as part of both its elementary and high school system" (Ibid.). Manual training is permissive in other towns. It is found in the high schools of forty Massachusetts towns or cities, in the grammar schools of eighty municipalities, and in the evening schools of eight or ten. This does not include the very elementary work done in schools all over the State in connection with the teaching of drawing, gardening, and kindergarten. The model and practice schools affiliated with the State normals do excellent work in manual training. There are 170 supervisors of drawing (freehand, etc.) in public schools in the State, and 60 manual training teachers. "Towns or cities of 10,000 or more inhabitants must maintain evening schools for the instruction of persons over 14 years of age in drawing, both freehand and mechanical" (School Laws). Boston provides for two hours per week (in all grammar schools) in cooking, sewing, woodworking, cardboard construction and clay modeling. This city also has the manual training high schools known as (1) The Girls' High School of Practical Arts (second year of existence.—S., in first year, 200; second, 70), and (2) The Mechanic Arts High School (L.+B., \$400,000; E., \$40,000; M., \$60,000. Cost of instruction per pupil, \$190–\$200 annually). These institutions are among the best of their kind. Upon the application of the Boston School Committee, the (3) Public Evening Drawing School was recently placed under the supervision of the State Commission on Industrial Education (see below). S., \$1,185; cost of instruction per pupil, \$23.35. The school buildings are used. The State gives 20% of cost of maintenance. (4) Springfield H. S. Maintains the usual four years' manual training H. S. course; also has important commercial department, and evening industrial improvement and trade division. L.+B., \$292,859; E., \$49,193; M., \$53,923.01. Day m. t. students, 422; commercial, 365; evening school, 396; total, 787. This school (est. 1898) under superintendency of Dean T. M. Balliet, was the first to establish an evening trades department as part of a board of education institution, and has been very successful under the able administration of Director Warner. Taking investment, main-

tenance, etc. into account, the average cost of instruction per pupil cannot be figured at less than \$100 annually, including evening and commercial students. In November, 1908, the enrollment in the evening department was as follows: mechanical drawing, 139; mathematics, 38; machine shop practice, 86; woodwork, 27; plumbing, 31; electricity, 38; total, 359. (5) The Rindge Manual Training School, Cambridge. Maintained by the city. Usual four years' course. L. + B., \$208,800; E., \$39,920; M., \$44,860.45; S., 595. Annual cost of instruction per pupil, \$70.18 (evidently does not take investment, etc., into account).

State Schools, and the Commission on Industrial Education.—The Massachusetts Agricultural College, at Amherst, is a technical institution of full collegiate rank. It receives two-thirds of the Federal grants for Massachusetts. L. + B., \$415,621; E., \$150,404; M., \$95,827. Students: collegiate, 245; graduate, 7; short courses, 252. No tuition for residents of the State. (2) The Textile Schools at Lowell, New Bedford and Fall River (Bradford Durfree) receive State and municipal support (Act of 1895), and are otherwise aided by private contributions and tuition fees. The State and local municipalities are represented on the boards of trustees, the majority (two-thirds) of whose members are engaged in the textile industries. There are both day and evening classes. Day courses are usually attended by high school graduates, evening courses by workers above the age of fourteen. A great variety of instruction is offered. The schools are thoroughly equipped, and the teaching is practical. Tuition ranges from nothing (or a nominal fee) in evening courses to \$100 or over for the day students (with an added 50% for non-residents of the State. Lowell statistics: 129 day S., 483 evening. M. from State, \$29,000; from city, \$8,000; tuition, \$12,665; contributions, \$4,343. L. + B., \$345,637; M., \$196,087. New Bedford: S. in day courses, 28; evening, 440. Bradford Durfee: day S., 10; evening, 226. (3) The Massachusetts Normal Art School, Boston, has had a long and honorable career in the training of teachers. It was the "offspring of an absolute necessity." The Act of 1870 required the establishment of evening drawing-schools in cities with 10,000 inhabitants or over, but competent teachers could not be found in sufficient num-

bers. Hence the school (est. 1873). Four-year courses are offered in (a) drawing, painting and composition, (b) modeling and design in the round, (c) constructive arts and design, (d) decorative and applied design, (e) teaching of drawing in the public schools, and methods of supervision. For admission, graduation from a H. S. (or the equivalent) is required. L.+B., \$285,000; E., \$16,000; M. from State, \$34,226; S., 335. (4) Manual training is an important feature of the State Normal School courses in Bridgewater, Fitchburg, Framingham, Hyannis, Lowell, North Adams, Salem and Westfield. (5) The State Commission on Industrial Education, and its Schools. A State Commission on Industrial Education, consisting of five members, was duly appointed in accordance with the recommendations of the Douglas Commission on Industrial Education, of the year 1906. The Commission has made great progress in the establishment of industrial schools and courses. February 1, 1909, the total enrollment in the institutions under control of the Commission was over 3,000 pupils. The Commission was obliged to begin at the beginning, as there were no State industrial improvement schools or trade schools in existence in Massachusetts when the Commission was organized. The industrial schools are established at Beverly, Boston, Brockton, Cambridge, Chicopee, Lawrence, Montague, Natick, New Bedford, Northampton, Pittsfield, Taunton and Waltham. In addition, Worcester and Lynn have taken steps for the establishment of industrial schools to be under the supervision of the Commission on Industrial Education. The subjects are taught in day schools at Montague and Northampton, and in evening schools in the other cities mentioned. Lawrence already has the following courses: woolen and worsted spinning and weaving, dobby and Jacquard weaving, woolen and worsted finishing, cotton spinning and weaving, textile designing, industrial and commercial electricity, practical and experimental dyeing; industrial and commercial chemistry, steam engineering for engineers and firemen, cloth calculations, mill arithmetic and bookkeeping; blue-print reading and arithmetic for machinists; arithmetic for engineers and firemen, loom fixing and calculation, and dressmaking. At Beverly, instruction is given in machine drawing, freehand drawing, architectural drawing, applied

science, gas engines, shop mathematics, and engineering mathematics. In each of the cities new industrial subjects are being added as required. Electricity, clothing economics, food economics, carpentry, pattern making, tool and jig making, sheet metal drafting, ship drafting, woodworking, clay modeling, millinery and agriculture are some of the subjects developed in other schools. The excellent yearly and special reports of the Massachusetts Commission are of great value to all students of industrial education. (Address the Secretary of the Massachusetts Commission on Industrial Education—Hon. Chas. H. Morse, Boston—for copies of the reports.)

Private Foundations Giving Higher Technical Instruction.—The Massachusetts Institute of Technology, at Boston; Worcester Polytechnic Institute, at Worcester; Tufts College (P. O. Tufts College); and Harvard University, at Cambridge, in the order given, are the chief institutions in Massachusetts which furnish higher technical instruction. The Massachusetts Institute of Technology receives a portion of the federal aid for the mechanic arts, and both the Massachusetts Institute of Technology and the Worcester Polytechnic Institute have scholarships maintained by the State. Architects, engineers, and manufacturing chemists are trained in the foregoing institutions. Under the auspices of the Massachusetts Institute of Technology, the Lowell Institute School for Industrial Foremen has been established. The courses are given in the evening—one mechanical and the other electrical. Each extends over two years. S., 202.

Private Foundations of Sub-Collegiate Grade.—(1) The Franklin Union, at Boston. The Franklin Union is an evening industrial improvement school. It is in charge of a board of trustees known as the Franklin Foundation. The building is beautiful in construction, and is admirably adapted for the purpose of the school, and the library to be established. The Franklin Union is the result of the foresight of Benjamin Franklin, who left a modest sum of money to be compounded for a period of one hundred years. The fund amounted to over \$400,000, eventually, and this sum was duplicated by Mr. Andrew Carnegie. The school was opened for the first time in September, 1908; evening instruction only is given. It was the original plan to

make the school co-educational, but at present the courses are open only to men who are employed during the day. Classes are held, for the present year, on three nights per week, from the last of September to the first of April. Tuition fees are merely nominal. Textbooks, supplies and drawing equipments are sold at a figure considerably below the usual retail prices. During the current year, instruction is given in the following subjects: mechanical drawing, machine details, mechanism, drawing for carpenters and builders, shop formulæ and industrial arithmetic, practical mathematics for carpenters and builders, industrial chemistry, steam engines and boilers, industrial electricity, and mechanics. L. + B., \$475,000; Endowment, \$408,000. S., 400.

(2) The Evening Trade School of the Massachusetts Charitable Mechanic Association, at Boston, was founded in 1900. The instructors in the school have been selected from the members of the association. Courses are given in plumbing, carpentry, sheet metal work, tile setting, bricklaying, painting, electricity, and pattern drafting. The classes are open to men of good moral character, who are over seventeen years of age, and are able to read and write. The tuition fee is twelve dollars per term. A term comprises about seventy evenings. The complete course in each trade requires three terms. Preference is given to those who are already working at the trade in which they wish to obtain instruction. S., 160. The annual cost of instruction per pupil is about \$43. This does not take into account the investment in land and buildings.

(3) The Wells Memorial Institute maintains free evening lectures in electricity, steam and steam engines, mechanical drawing, practical mechanics, machine drawing and household science, and free evening classes in millinery and dressmaking. Average attendance in the classes mentioned, 487; total enrollment in the institution, 1,402.

(4) Classes in millinery, dressmaking and other industrial subjects for women are conducted under the auspices of the "Women's Educational and Industrial Union" of Boston.

(5) The Boston Trade School for Girls is similar in scope to the Manhattan Trade School for Girls. The enrollment is 150, divided between the departments of dressmaking, 60; millinery, 50; hat manufacture, 15; clothing manufacture, 25. Tuition is free. Girls are ad-

mitted at the age of fourteen. The school courses continue throughout the year. The annual cost of instruction per pupil is put at \$120. The maintenance is chiefly derived from private subscriptions. A building is rented for the purposes of the school for \$1,500 per annum; E., \$2,000; M., \$18,000. The graduates make good wages and advance rapidly in their trades. (6) The North End Union, at Boston, maintains an evening school of plumbing and a day school of printing. The instruction is supported by tuition fees and private donations. The candidate for the plumbing course must be at least 17 years of age. He is required to take fifty shop lessons and nine lectures. He pays a tuition of ten dollars; S., 34. In the printing department candidates must be at least sixteen years of age. They work daily throughout the year; fees, \$100; S., 15. (Anyone desiring to see specimens of fine industrial school printing should write to Superintendent Samuel F. Hubbard, North End Union, Boston, Mass.) (7) The North Bennett Street Industrial School, of Boston, has about 750 boys, girls and women attending the various clubs and classes. Several industrial courses are given. (8) Under the auspices of the Hale House, instruction in manual training, cooking, sewing and drawing is given to a large number of boys and girls. (9) The Worcester Domestic Science School, at Worcester, is the outgrowth of the Oread Institute, now closed. In addition to the regular instruction there is a normal course. L.+B., \$10,000; E., \$5,000. (10) The Farm and Trades School, located on Thompson's Island, Boston, admits poor boys between the ages of ten and fourteen. Agriculture, manual training and printing are among the subjects taught. S., 100; L.+B., \$372,129; E., \$29,570; M., \$29,000. (11) The industrial classes of the Y. M. C. A. and the Y. W. C. A., especially at Boston, but also throughout the State, are largely attended. Other institutions giving some industrial or manual training are: The People's Institute, the Boys' Institute of Industry, the Hebrew Industrial School, the School of the Museum of Fine Arts, the Coyne School and the McDowell Millinery and Dressmaking Schools of Boston, the South End Industrial School, of Roxbury; the Apprentice School of the General Electric Company, at Lynn,

and the American Steel and Wire Company's School, at Worcester.

MICHIGAN.

Manual Training and Industrial Education.—Without special State support, manual training has been introduced into the public schools of all of the principal cities and towns, and many of the smaller municipalities. A few rural high schools have been established in townships where there are no graded schools, and these institutions usually include manual training, domestic science and the elements of agriculture in their courses of study. A State law of 1907 authorizes the establishment of "county schools of agriculture and domestic economy" (one in each county, or counties may combine). "Instruction shall be given in the elements of agriculture, including instruction concerning the soil, plant life and the animal life of the farm; a system of farm accounts shall also be taught; instruction shall also be given in manual training and domestic economy and such other related subjects as may be prescribed. Each such school shall have connected with it a tract of land suitable for purposes of experiment and demonstration of not less than ten acres in area." Tuition free. Pupils of advanced age may be admitted to winter courses. No State aid. Menominee county established the first school of the kind to be under the Michigan law. The county voted \$20,000 for the building and equipment and the city of Menominee, where the school is located, gave a tract of land containing one hundred fifteen acres. This school opened in 1908. Admission is at the completion of the eighth grade and the course covers two years. There are no important trade schools in the State. Industrial improvement schools, or courses, in the State were first established at East Saginaw, and are also found in connection with the Y. M. C. A. work. The Detroit Y. M. C. A. offers instruction in the trades, as well as industrial improvement courses. (1) The Muskegon High and Hackley Manual Training School is a well-developed institution. Pupils must have completed the seventh grade for entrance and the length of the course is five years. Endowment, \$610,000; L. + B., \$225,000; E., \$33,-

795.02; M., \$30,000. Enrollment, by subjects: Manual training, 435; domestic science, 242; domestic art, 287; applied art, 141; freehand drawing, 181; mechanical drawing, 194; physical training, 451.

State Schools.—The University of Michigan, at Ann Arbor, the largest of the State universities, has a very strong department of engineering (S., 1,700), in which four-year courses for graduates of approved high schools are offered in civil, mechanical, electrical, chemical, marine and architectural engineering and in naval architecture and architecture. Two townships of land given to the University by the Federal Government were sold and the money invested so that the proceeds yield an annual income of \$38,500. The State makes an annual appropriation of the proceeds of a $\frac{3}{8}$ mill tax (\$667,351). Student fees are low, but the number of students is so large that the aggregate income from this source is \$322,853 (in 1908). L. + B., \$2,146,215; E., \$1,040,787; M., \$1,003,000; S., 5,010. (2) The Michigan State Agricultural College, at Lansing, the first institution of the kind to have been established in America (opened early in 1857, offers four leading courses, in agriculture, engineering, home economics and forestry. Each of these requires four or five years for completion—four, if the student is a graduate of an accredited high school. Short courses are also offered, farmers' institutes are conducted under the auspices of the college and a Farm Home Reading Circle is carried on by a member of the faculty. The State Department of Public Instruction has arranged with professors of the faculty to write bulletins which shall be of assistance to teachers of rural subjects, and several have been issued already. The college forests of 42,000 acres give ample opportunity to conduct practical field work in connection with the summer courses in forestry. A course in pedagogy, which tends to develop into industrial pedagogy, is frequented by intending teachers. Total S., 1,191. (3) The Michigan College of Mines, at Houghton, in close proximity to the great copper and iron mines of the Northern Peninsula and the Mesaba Range, is one of the most efficient institutions of its kind. S., 245. (4) The Michigan State Normal College, at Ypsilanti, the largest college for the training

of teachers in the world (in point of attendance and grade), is fully equipped to give instruction in manual training, domestic science, the domestic arts, drawing and other branches demanded by prospective teachers. Instructors are prepared for secondary schools, and also for work in the elementary grades and kindergarten. A feature introduced in recent years in this, as well as other State Normals of Michigan, is a course designed especially for prospective teachers in the rural schools. Manual training for the rural school, drawing for the rural school, agriculture for the rural school and the other subjects to be taught are organized to suit the particular needs of the rural community. This striking innovation, together with the introduction of county normal training classes in the several counties, has had a wonderful effect in raising the standard of training required of rural school teachers in the State. (5) The State Normals at Mt. Pleasant, Kalamazoo and Marquette have followed the example of the Ypsilanti Normal College in furnishing facilities for manual training and allied branches. The Kalamazoo Normal is conducting an interesting experimental adjunct in the way of a correspondence school. (6) The schools for reformation and for the care of defectives have extensive industrial departments.

MINNESOTA.

Manual Training and Industrial Education.—No provision for State aid, except to particular schools. Manual training and closely related subjects are taught to over 5,000 pupils in the public schools of the State annually. Considerable interest has lately been manifested in "consolidation" of rural schools, and in the establishment of county schools of agriculture, and Minnesota will doubtless have many of these agencies for improvement before long. The Mechanic Arts High School, of St. Paul, is installed in a building which cost \$100,000. It is to have a new structure, to cost \$150,000. Present outlay for salaries, \$30,000 annually. S., 692.

State Schools.—The University of Minnesota, at Minneapolis, includes in its faculties the College of Agriculture (receiving

the Federal grants), the College of Engineering and the Mechanic Arts, the School of Chemistry and the School of Mines. The University has an endowment of about \$1,500,000 and property worth several millions. It has no separate endowment for its various schools and colleges. In the College of Agriculture, a portion of the work is taken in the College of Science, Literature and the Arts. Courses in agriculture and kindred subjects, forestry, home economics and a normal course are offered in the College of Agriculture. Short courses are given also. Hydraulic and municipal engineering, railway, civil, structural, mechanical, electrical and experimental engineering are taught in the college devoted to the mechanic arts and engineering. The University maintains a dairy school at St. Anthony Park, a school of agriculture at Crookston and United States Experiment Stations, or sub-stations, at several points. S. in Univ., 4,600. (2) The State Normal Schools at Winona, Mankato, St. Cloud, Moorhead and Duluth have facilities, in general, for instruction in manual training and domestic science. (3) The Minnesota School for the Deaf, at Faribault, gives a choice of ten trades to the inmates. The Minnesota School for the Blind, likewise at Faribault, has some industrial work. The School for Feeble-Minded and Colony for Epileptics offers, to the most capable of its pupils, instruction in printing, tailoring and dressmaking, farming, carpentry, cabinet work, wood-turning, mat weaving and brush making.

Indian Schools.—Schools furnishing industrial training of various kinds to Indian pupils are found at Morris, Pipestone, White Earth and Tower:

MISSISSIPPI.

Manual Training and Industrial Education.—Manual training has been introduced in a few public schools. In all the elementary public schools agriculture must be taught. Purely industrial schools are not to be found.

State Schools.—(1) The University of Mississippi, at University, has a few students in its civil, electrical and mining en-

gineering courses; total S., 348. (2) The Mississippi Agricultural and Mechanical College, at Agricultural College (near Starkville), has the following schools: Agriculture, engineering, textile industry, industrial pedagogy. Regular four-year courses and short courses are given (including those of the summer session). Ent. req. for freshman class: good health, age at least sixteen, ability to pass a good examination in English grammar, arithmetic, geography and history of the United States. The institution is wisely meeting a great need through the development of its School of Industrial Pedagogy, where educational theories and practices are taught in conjunction with the technical training. Another innovation which places the College among the ranks of the leaders is the introduction of a "practical working boys' course," where boys or young men who come to the school with no capital but grit and determination are given the opportunity of working on the farm, for pay, with evening instruction, until able to afford the day courses. Sixty-five individuals were enrolled in the "working boys' course" last year. In the short courses, the instruction in agriculture, cotton manufacturing, textile chemistry and dyeing and industrial pedagogy is the feature. The School of Textile Industry includes the departments of yarn manufacture, textile chemistry and dyeing, hand and power weaving, designing and fabric analysis, and aims "to supply strictly technical training in the theory and practice of cotton manufacturing in all its branches." S. in the college, 1,378 (including 363 in summer school and 263 in preparatory department). The following account of the status of the Agricultural Land Scrip Fund, donated by the United States Government, is of interest: "The scrip, representing 207,920 acres of public land, was sold for about ninety cents per acre, realizing in currency \$188,298. This amount, by judicious management, was increased to \$227,150, which is now in the State treasury, represented by thirty-two-year bonds, running from 1896 to 1928, bearing six per cent. interest per annum. The Legislature, by act of February 28th, 1878, divided the sum equally between Alcorn Agricultural and Mechanical College (for colored, see below) and the Mississippi Agricultural and Mechanical College. The proceeds of a sale of bonds for \$15,000, authorized by the

Legislature for the purchase of lands, left in the treasury to the benefit of the latter college \$98,575, yielding an annual income of \$5,914.50." (3) The Mississippi Industrial Institute and College, at Columbus, is the State college for women, and claims to be the first of the type ever established (1884). Besides other courses it offers instruction in dressmaking, telegraphy, decorative and applied design, photography, millinery, domestic science and home economics. Proficiency in grammar school subjects is required for entrance. S., 800 (college, 400; normal, 200; taking industrial subjects, or commercial, 200). Endowment, \$157,650. Maintenance, from interest on endowment, tuition in music department (other departments are free), and balance from the State appropriations. L.+B., \$50,000; E., \$25,000; M., \$70,000; cost of inst., \$100 annually per pupil. (4) Alcorn Agricultural and Mechanical College (for colored), at Alcorn, offers degree courses in agriculture and horticulture, and also, instruction in a full list of trades. L.+B., \$225,000; M. from United States, \$29,830.44; from State, \$15,050. S., 542 (of these, 439 in preparatory department); annual cost of inst., \$83 per pupil.

Private Foundations for Colored.—Rest University, at Holly Springs, requires every student enrolled to take some manual or industrial training. S., 366. Other schools, for colored, with manual or industrial courses are Tougaloo University, Tougaloo; Mary Holmes Seminary, West Point; Okolona Industrial College, Okolona; Meridian Academy, Meridian; Lincoln School, Meridian; Jackson College, Jackson; Kosciusko Industrial College, Kosciusko; Southern Christian Institute, Edwards, and Mount Hermon Seminary, Clinton.

MISSOURI.

Manual Training and Industrial Education.—No mandatory provisions or special State aid. In the public elementary schools of the principal cities and towns manual training is found, and in quite a number of high schools manual training, and in a few domestic science and domestic art, are subjects having place in the curriculum. In its Teachers College the University of Mis-

souri maintains a well-equipped manual training department for the preparation of teachers. Within the past few years it also has developed a strong department of domestic science. Elementary agriculture is taught at the five State normal schools. The normal schools at Kirksville and Warrensburg have good courses in domestic science, and are developing courses in domestic art. Under the inspiration of these State schools and Washington University of St. Louis the high schools are taking up the new subjects and handling them very successfully. This is especially true of the high schools of the cities of St. Louis, Kansas City, St. Joseph, Springfield, Joplin, Independence, Moberly, Mexico, Webb City and Warrensburg. (1) The Manual Training School of Washington University, St. Louis, opened in 1880, was "the first institution of high school grade to make instruction in the mechanic arts an essential part of its curriculum." It has greatly influenced the manual training movement. A four-years course is given to graduates of the elementary schools. "The course of study is designed to combine manual with mental training; to put the liberal arts and the mechanic arts side by side; to deal simultaneously with material forces and appliances and spiritual forces and appliances; to cultivate the judgment and executive faculties as well as the memory and the understanding; to extend the 'humanities' so as to include human life, human activities and human needs as they exist now." The school leads, naturally, to the higher technical colleges. Tuition, \$100 to \$150 per annum. L., \$32,653; B., \$163,804; E., \$26,413; M., \$28,398. S., 230. Other important manual training high schools at St. Louis are the McKinley, Yeatman and Central. Kansas City has an important manual training high school also (L. + B. + E. = \$203,550).

State Schools.—(1) The University of Missouri, located chiefly at Columbia, includes in its organization also the School of Mines and Metallurgy, at Rolla (S., 229). The departments at Columbia with which this memorandum is chiefly concerned are Teachers College, the School of Agriculture and the Department of Engineering. Teachers College is one of the best developed institutions of its kind in the country, and includes in

its courses a variety of sub-vocational subjects, home economics and allied branches. The School of Agriculture receives Federal aid and offers a number of full and short courses. University extension centers are maintained in such localities as Joplin, Mexico, Clinton, Kansas City, Clinton and St. Louis. S. in Universities, 2,536. (2). Lincoln Institute (for colored), at Jefferson City, shares in the Federal grants for agriculture, and receives State appropriations. In addition to the academic branches, agriculture, millinery, sewing, cooking and shop and building trades are taught. S., 540.

Private Foundation.—Washington University, at St. Louis, has strong engineering departments.

Reform Schools.—The Missouri Training School for Boys, at Booneville; the State Industrial Home for Girls, at Chillicothe, and the St. Louis Industrial School, at St. Louis, are reform schools in which industrial training is given.

School for Defectives.—The Missouri School for the Blind, at St. Louis, and the Missouri School for the Deaf, at St. Louis, are State schools for defectives, and manual and industrial training (including some trades) are encouraged here.

Trade School.—The David Rankin, Jr., School of Trades, located at St. Louis, is equipped with millions of endowment and bids fair to become one of the strongest institutions for the teaching of trades to be found in the country.

Miscellaneous Schools.—The St. Louis Watchmaking School, the Southwestern Railway Telegraph School and the Y. M. C. A. educational departments, at St. Louis, are institutions offering trades or industrial improvement instruction.

Additional School for Colored.—George R. Smith College, at Sedalia, affords some manual and trades instruction.

MONTANA.

Manual Training.—There is no provision in the State law for the direct payment from the State treasury for manual training in the public schools. The State law apportions public school funds to the several counties of the State. The last apportionment was \$3.10 per capita. This money may be used for general

school purposes, and some of it is devoted to manual training. In connection with the high school courses at Helena, Butte, and Billings, manual training is taught, as also in the grades in the foregoing cities and in Bozeman, Great Falls and Missoula. The college at Deer Lodge maintains a course in manual and industrial training. The Beaverhead County H. S., at Dillon, gives a four years' agricultural course and a two years' course in domestic science. L.+B., \$35,000; E., \$4,000; M., \$10,855.70. Annual cost, of instruction per pupil, \$86.47. S., 92 (12 in agricultural, 20 in commercial course). "The most grievous difficulty which we have encountered is the lack of suitable textbooks in agriculture. We solve it by using what books there are written on various subjects of agriculture, if not too technical or advanced. The instructor is an agricultural college graduate who rewrites some parts. He also dictates in the case of subjects where there are no texts" (From letter of the principal to the Commission). The State Normal School, at Dillon, furnishes instruction in manual training and domestic science.

Industrial Education.—There are no industrial, or trade schools in the State, unless the Indian schools at Fort Shaw, Harlem (Fort Belknap), and Poplar may be included in the list of industrial institutions. The manual work taught here is very elementary, however. Likewise is that of the reform schools—Montana State Reform School, at Miles City, and Butte Industrial School, at Butte.

State Schools.—(1) The University of Montana (Missoula) has a strong engineering and trades department. The institution was given a Federal endowment of 72 sections of land. S., 291, of whom about 100 are of preparatory grade. (2) Montana State College of Agriculture and Mechanic Arts (Bozeman). This institution receives the annual Federal grants for agriculture, and was deeded 140,000 acres of land by the Federal Government as a permanent endowment. The land cannot be sold at less than \$10 per acre. The college is well developed, and offers a variety of farm and engineering courses. S., 419, of whom 220 were classed in the preparatory department, or in the school of music. (3) Montana School of Mines (Butte). Gives a highly practical

course in mining engineering. S., 76. Cost of instruction per pupil, \$400 annually.

NEBRASKA.

Manual Training, and Industrial Education.—No State provision except that referring to manual training, domestic science and the elements of agriculture in county high schools. These subjects must be taught in the ninth and tenth grades of the schools mentioned above, and in the eleventh and twelfth grades the theory and practice of agriculture are required subjects. Only one county high school has been established as yet in Nebraska (under the recent law), the Kimball County High School, at Kimball, but Wheeler county is taking steps for the introduction of such a school, and in other counties the question is receiving consideration. York, Lincoln, Omaha, Columbus, Beatrice, Crete, Geneva, Fairmont, Hebron and Holdrege are municipalities having manual training instruction in the high schools. The Kearney State Normal, the Peru State Normal, and Wayne Normal School teach manual training and domestic science. In the Indian schools, known as the Geona Indian School, at Genoa, and the Santee Normal Training School, at Santee; in the reform schools, designated as the Industrial School for Boys, at Kearney, and the Industrial School for Girls, at Geneva; in the Institute for the Blind, at Nebraska City; in the School for the Deaf, at Omaha; and in the Institute for Feeble-Minded Youth, at Beatrice, manual training or trades instruction, or both, are given. There are no trade schools in Nebraska.

State University—The University of Nebraska, at Lincoln, has an Industrial College, which offers engineering courses, and agricultural instruction. This department secures for the institution the Federal grants. In the Industrial College are the secondary schools of Agriculture and Mechanic Arts, furnishing courses of two or three years, or less, to students at least sixteen years of age, and who present satisfactory proof of an understanding of arithmetic and elementary English grammar. S. in university, 3,237. Like at least ten other State universities, the University

of Nebraska receives a large part of its income from a State tax—a "mill tax."

NEVADA.

Manual Training and Industrial Education.—Nothing of importance has been done in Nevada in the way of manual training instruction. There are no industrial schools in the State, except as noted below (Sparks).

State Schools.—(1) The University of Nevada (Reno) is the only institution of college grade within the borders of the State. It has a College of Agriculture (one student in 1908), and receives the Federal grants. Of importance industrially are also the short courses, the university schools of mechanical engineering, of civil engineering, of domestic science (one student in 1908), and the Mackay School of Mines, free tests of ores are made). The University High School and the State Normal School, both in connection with the University, furnish instruction in manual training and domestic science, agriculture, animal husbandry and horticulture. The Mechanical Engineering Department of the University gives instruction to the apprentices (37) in the railroad shops of the Southern Pacific Company at Sparks—two evenings each week in elementary mechanical drawing and the elements of steam design. Total S. at Reno, 316 (125 in Univ. H. S., 19 in Normal School, 62 in liberal arts, 61 in mining, 9 in general science, 38 in engineering). (2) The Virginia City Mining School (est. 1903, by the Legislature) is intended to be of help, vocationally, to the miner, no matter what his previous schooling. The school is growing steadily. S. 35.

Indian Schools.—The Western Shoshone School at Owyhee and the Carson Indian Training School, at Stewart, devote about 50 per cent. of the time of instruction to manual work.

NEW HAMPSHIRE.

Manual Training and Industrial Education.—No special provision in State laws. Manual training is taught in the seventh and eighth grades and in the high schools at Berlin and Con-

cord, in the eighth and ninth grades at Manchester and the elementary grades at Rochester. The Gilmanton and Coe's Northwood Academy are giving agricultural courses. The "standard program of studies for secondary schools," issued by the Department of Public Instruction, outlines a course in agriculture.

State Schools.—The New Hampshire College of Agriculture and the Mechanic Arts, at Durham, offers a general course—mechanical, electrical and chemical engineering; a two years' and a four years' course in agriculture, besides short courses for farmers. S., 212.

Private Foundation.—(1) The Manchester Institute of Arts and Sciences is not a technical or industrial school in the strict sense, but affords some industrial training. There is a wide range of subjects—from woodcarving to esperanto. Funds are derived from annual membership fees (\$3.00 for adults, 50c. for children). Members are entitled to all privileges (lectures, concerts, classes, etc.) without further cost. M., \$4,275 S., 600 (274 in Art Department). Quarters are rented. (2) Dartmouth College, at Hanover, and St. Anselm's, at Manchester, offer single engineering courses.

NEW JERSEY.

Manual Training.—Under the Manual Training Act, which has been in force for over twenty years, some fifty school districts now avail themselves of the State aid for manual training. The State support duplicates the amount expended by the local district itself each year for the maintenance of manual training instruction, but the minimum sum to be received, annually, from the State treasury by any district is \$250 and the maximum is \$5,000. The legislative appropriations in 1908 for the duplication of local manual training expenditures amounted to \$85,000 (\$10,000 + \$75,000). The manual training appropriation for the fiscal year became exhausted early in the summer of 1908, due to the increasing number of applications. It is chiefly in the elementary schools that manual training is taught in the State, although it is also found in the high schools of several districts. The time devoted to manual training varies in the

schools of the different localities, but the annual reports show that the boys and girls throughout the State who are enrolled for this subject (some in one branch of it; some for more than one) average a total of about one and one-half hours per week in the work. It is only necessary to inspect the manual training classes in the various districts to become convinced that the instruction is in the hands of a competent and devoted body of teachers and supervisors.

Industrial Education.—The Industrial Education Act dates back to 1881, with slight modifications. It provides for the duplication, by the State, of moneys contributed in any locality (not less than three thousand dollars) for the establishment of an industrial school. For maintenance, the State likewise duplicates the local appropriations annually, but not to exceed \$7,000 per annum to any one school. The legislative appropriation for industrial education, in 1908, was \$20,000 (\$7,000 each for the Trenton and Newark schools, and \$6,000 for that of Hoboken). This year, each of the three State industrial schools receives the maximum State appropriation, \$7,000. There is a separate board of trustees for each school, independent of the local boards of education, and of the State Board for the common schools. The Governor of the State, *ex-officio*, the mayor of the municipality in which the school is located, *ex officio*, and six other individuals, resident in the locality, and appointed by the Governor, constitute the board for each school. In the order of their founding, the institutions are as follows: (1) The Newark Technical School (established 1884 or 1885). Co-educational, but organized chiefly for male students. The only director the school has ever had, Professor Charles A. Colton (Columbia University, School of Mines), entered upon the duties of organization and management December 15th, 1884. At the outset, a small building, with four classrooms, was rented. The school was opened February 9th, 1885. Later, the present site was purchased for \$14,000, and in 1892 the director undertook the task of raising money by private subscription for the erection of a suitable building—to cost \$40,000. By the beginning of the year 1893, the subscriptions amounted to \$23,000. Then came the country-wide financial panic, and but little could be done. In

1896, the building fund had reached \$26,000. To this, the common council added \$5,000, and the erection was begun of the building now occupied. The school has long since outgrown its present quarters, and a new building is urgently needed. The instruction has been given almost exclusively in the evening. The institution is an industrial improvement school, with a trade course in plumbing. Until recently, applicants for admission (not under sixteen years) were required to show evidence of previous training at least equal to eighth grade graduation. Although this is still the standard demanded for entrance to some courses, the trustees have lately made a beginning toward meeting the new demand for elementary industrial instruction for adults, by providing a course for machinists in which the academic standard for admission is not so high. This is to be followed by the introduction of courses for carpenters, molders, and the representatives of other industries. The subject matter will be organized to suit the needs of each group of workers. The school year extends from about the first of October until the middle of May, and is divided into two terms. The general technical course, and the courses in building construction, and in jewelry and silverware design, are five years in duration. Tuition is free to residents of the municipality, in the general technical and building construction courses. In the course in designing for jewelers and silversmiths, the tuition for all students is \$5 per term for the first year, and \$7.50 per term for the succeeding years. There are two-year courses in theoretical and applied electricity, and in electric wiring; in electroplating, and in plumbing, with tuition charges of \$5 to \$7.50 per term. Instruction is also given in mechanical, architectural, and freehand drawing; in illustration; in modeling; in drawing from life; in industrial mathematics; industrial chemistry, and several other subjects of value to those occupied in the industries. About four hundred students are enrolled during the year. The city of Newark appropriates \$10,000 annually toward the maintenance of the institution. (The cost of instruction, and other information concerning the N. T. S., is given in Appendix C.) (2) The Hoboken Industrial School was organized in 1888. It is housed in a building which includes also the Free Public Library. The

cost of the edifice was \$76,000, of which the city of Hoboken paid \$50,000. The balance was subscribed by the Stevens family (founders of the Stevens Institute of Technology), with the understanding that a home for courses in industrial education should be provided in the building. The trustees of the State Industrial School are granted, by the city, the use of the premises. They conduct the industrial school in the evening, and during the day maintain a manual training school for pupils who come from the fifth, sixth, seventh and eighth grades of the public schools. The pupils in these grades are required to take from one to one and one-half hours per week in either: (a) sewing (girls, in fifth and sixth grades); (b) cooking (girls, in seventh and eighth grades); (c) modeling, etc. (boys, in fifth and sixth grades); (d) woodworking (boys, seventh and eighth grades). The instructors are paid by the trustees of the State Industrial School, and the work is done without charge to the local board of education. The sewing is taught in the city schoolrooms, and the other subjects at the Industrial School. The manual training work is given a trend as live and vital as is possible. It is the expressed desire of the city superintendent of schools to provide for manual training instruction in the regular school buildings, so that the Industrial School may be devoted by its trustees entirely to industrial education. The enrollment for 1907-08 was: in woodworking, 770; in clay modeling, 325; in sewing, 900; in cooking, 305. The industrial education classes are held for two hours during the evenings—on Mondays, Wednesdays and Fridays—throughout the months of November, December, January and February. Enrollment: in industrial mathematics, 17; in mechanical drawing, 174; in industrial sewing, 110; in cooking, 45. The night school pupils are past the compulsory school age. Professor Egbert C. McNary is the head of the institution. M., in 1907-'08, \$11,373.98—of which about \$1,400 was expended upon the industrial (night) school. The appropriation of the Common Council was \$6,000; and an equal amount was received from the State treasury. This year, each contributes \$7,000. (3) The School of Industrial Arts, Trenton. This institution was organized in 1898, as the outgrowth of an evening drawing course which had been maintained for about a

decade previously. In 1902, it was put under the management of a board appointed in accordance with the Industrial Education Act of 1881. Its growth during the past few years has been especially noteworthy. In 1906, Professor Frank Forrest Frederick, who for sixteen years had been at the head of the Department of Art and Design, in the University of Illinois, was appointed director. The institution is a combination of an industrial improvement, industrial art, and fine arts school, but the industrial improvement side may be said to preponderate. There are both day and evening classes (the latter are most frequented in the industrial improvement subjects), and special courses on Saturdays for children and teachers. Bookbinding, porcelain designing, ceramics, and modeling designed to bear directly on the pottery trade, are some industrial courses offered here which are not as yet developed at the other State industrial schools. The art side of the school is naturally important. There has lately been a tendency to seek to build up courses of particular value to the local industries. The class in mechanical drawing is large. Tuitions are about the same as given above (for Newark). S., 345. There were no graduates before 1907; since that date there have been eleven. Income: from the State, \$7,000; from the city of Trenton, \$7,000; from tuitions, \$1,000. E., \$3,000. The school is located in an old building formerly used as a private residence (with annex), which is rented. A suitable housing is very much needed (Sp., also *Appendix C*).

State Manual Training and Industrial School for Colored Youth.—This institution, located near Bordentown, has been under State control since 1894. It is supervised by a committee of the State Board of Education. A farm of 225 acres is devoted to the use of the school. There is an administrative building, besides two dormitories, a laundry and several farm buildings. Until recently very little industrial instruction was given, but under the present director, Professor J. Thomas Caruthers (graduate of the Massachusetts Agricultural College at Amherst), the industrial departments are being developed rapidly. The institution is co-educational. About 68 girls and 56 boys are enrolled. In addition to the necessary academic training the boys are taught carpentry and agriculture. It is the plan to in-

introduce a variety of trades in the near future. The girls are given instruction in sewing, cooking, laundry work and basketry. Candidates for admission to the school must be 14 years of age or over. Students from outside the State are not admitted. Scholastic requirements for entrance: ability to read and write and to perform fundamental operations of arithmetic. The course is six years in duration. Length of school year, eight months. Board is charged for at the rate of \$6.00 per month, and washing \$1.00 per month. There are no fees for instruction. L. + B., \$68,106; E., 11,980.70; M., about \$24,000, of which about \$5,000 is restored in the form of revenue from the boarding of students.

Private Foundations.—Princeton University, at Princeton. At this famous university courses in civil and electrical engineering are offered. S. in university, 1,301. (2) Stevens Institute of Technology, at Hoboken. This virile institution "lays some emphasis on that branch of engineering which is rather indefinitely differentiated by the term mechanical." The full number of units of preparation demanded by the Carnegie Foundation for the Advancement of Teaching for the listing of colleges and universities is required for entrance. The course is four years in length. The institution aims to give the broad foundation needed for *any* branch of engineering, but during the senior year lays especial stress on those features which apply more distinctly to the mechanical branch of engineering. Special attention is given to electrical engineering. S., 390; Productive endowment, \$866,571.71. Support is from interest on endowment and student fees. L., \$375,000 to \$425,000; B., \$380,000. Mortgages on land and buildings, about \$210,000; E., \$100,000; Library, \$20,000 additional. Total cost of operating, about \$130,000 annually. The scheme of tuition fees is generous toward New Jersey, as residents of the State pay only \$150 per annum, while the standard rates for those coming from outside the State are \$225 annually. Yet New York sends more students to Stevens than New Jersey. The graduates occupy prominent positions throughout the world. In response to some inquiries, President Alexander C. Humphreys, of the Stevens Institute, wrote the commission as follows: "As to our difficulties, the one we find it hardest to meet is the lack of means. In spite of increased

requirements for admission and rather exacting requirements for the course, the enrollment has nearly doubled since 1902, when I succeeded Dr. Morton as president. We were poor before this increase; we are poorer now."

"Another difficulty is the insufficient preparation of the applicants for admission. I refer to the graduates of high and preparatory schools. I am satisfied that the preparation now afforded is in large measure superficial, due to the desire of school boards to cover so much ground." (3) Rutgers College, at New Brunswick, although a private foundation, has received the federal appropriations for agriculture and the mechanic arts since 1864, and also State appropriations. The Agricultural College is set down officially as "Rutgers Scientific School." "The State Agricultural College" is the term which is employed commonly to designate this branch of Rutgers. There are four-year courses in civil, mechanical and electrical engineering, agriculture and clay-working and ceramics; besides short courses of two years in clay-working and ceramics, and twelve weeks each in agriculture, dairy farming and fruit growing and market gardening. For the use of the Agricultural College a fine building was lately erected. Only recently has the school been in the position to push its agricultural and horticultural work most successfully, and there has been a new impetus to the growth of this side of the institution (cp., also, the statements of Dr. Voorhees in Appendix B, or send directly to him at New Brunswick for announcements descriptive of the work). S., in 1908, 255.

Private Industrial Schools.—(1) The Paterson Silk Textile Institute, at Paterson, is maintained by the Silk Manufacturers' Association, and is equipped to give practice to those who wish to follow the silk industry for a livelihood. The course in designing is three months. Warpings, broad weavers, ribbon weavers and winders are kept in the school until proficient. The rooms for the use of the institute are rented. E., \$7,123.56; M., \$6,678. Cost of instruction per pupil, about \$15. Enrollment (at one time), 88. Tuition fees are charged (\$2-\$25). Some of the products of the students' work are sold. (2) The Baron de Hirsch Agricultural School, at Woodbine (Cape May county), is a well-equipped institution, devoted to the training of young

Jewish men. The entrance requirements are nominal. Age limit, 18 to 20 years. The course is very practical, and aims exclusively to fit the students for farming and allied industries. No fees are charged, but the students are required to perform much healthful manual labor. There are short vacations during each twelve-month. Dormitory facilities exist for all in attendance. The farm contains 150 acres. L.+B., \$750,000; E., \$10,000; M., \$40,000—supplied from the Baron de Hirsch fund for America. Annual cost of instruction per pupil, \$166. F., 7; S., average attendance, 65; highest number enrolled during the year, 104. (3) The Y. M. C. A. classes. The industrial improvement sections are the most fully developed at Paterson, Camden, Newark and Elizabeth. (4) St. Bernard's School for Working Boys is located on a farm of 125 acres, near Gladstone, Somerset county. Grammar grade and high school subjects are taught, but the courses have no set length. A part of the afternoon is given over to the work of the farm, the carpenter shop or the printing office. Pupils enter at the ages 12 to 15. L.+B., \$20,000; E., \$1,750; M., \$5,000; endowment, \$10,000; S. 20, Annual cost of instruction per pupil, about \$40. A similar school has been started (1909) at Fairview Farm, near Frenchtown, Hunterdon county.

State Normal Schools and the Summer Courses.—(1) The State Normal School at Trenton provides courses in manual training for prospective teachers. The Farnum Preparatory School, at Beverly, is an adjunct of the Trenton Normal School. Some mechanical drawing is taught, as also in the Model School, at Trenton. (2) A newly organized department for instruction in manual training, drawing and applied art is attracting students to the State Normal School at Upper Montclair. The courses are under the direction of Professor Cheshire L. Boone. (3) An act of the Legislature approved April 1st, 1908, authorized the establishment of "summer courses (cp. Pennsylvania) for instruction in method of teaching elementary agriculture, manual training and home economics," and stipulated that an annual appropriation of \$2,000 should be made for this purpose. The location of the courses and the programs for the instruction are determined by the State Board of Education. A summer school

of four weeks duration was held at Cape May (in the high school building) in the month of July, 1908. "The aim of the school seems to be to train the teachers from the rural schools and small towns in the various forms of handwork suitable for the grades. This work is planned with a view of emphasizing its industrial significance. The work is related to the forms of industrial life with which the children are familiar. The work in agriculture and home economics is presented from the same point of view. The work is not intended to be directly vocational in character, but that for the upper grades is quite practical in its nature." (From special report of Professor R. W. Selvidge.)

State School for Defectives.—Industrial or trades instruction is an important feature of the New Jersey School for the Deaf, at Trenton, and of the New Jersey Home for the Education and Care of Feeble-Minded Children (and the similar Home for Women), at Vineland.

State Reformatory and Reform Schools.—(1) The New Jersey Reformatory, at Rahway. The inmates are received between the ages of 16 and 30 years. They are detailed to various trade classes, and make all the shoes, clothing, utensils and tools required for the institution; they erect new buildings and do all the repair work. The late superintendent stated that not \$50 was paid for the hiring of outside labor in 1907. The trades taught are blacksmithing, pipe-fitting, carpentry, plumbing, printing, laundering, tailoring, electricity, shoe and harness making, tinsmithing, masonry, machinist, leather working, and, in addition, farming. There is a night school. Not enough attention has been paid to the theoretical side of industrial instruction, industrial English, industrial mathematics and industrial drawing. This has been due largely to the absence of suitable vocational text-books. About one-half of the inmates have been kept on unskilled contract work (such as the manufacture of shirts and overalls). The majority of the inmates come to the institution without a trade. A problem faced by the Reformatory Commissioners and the superintendent is: shall there be put at work in the skilled trades chiefly those who have worked at them before, and shall those who perhaps need the skilled trade the

most (in order to encourage them to lead correct lives after release), shall these be put at routine factory work which they will avoid when released, or shall they be taught a more paying trade? (2) The New Jersey State Home for Boys. Located at Jamesburg. Instruction is given in academic subjects and in various industries—blacksmithing, shoemaking, painting, frescoing, paperhanging, masonry, carpentry, printing, brickmaking, caring for stock, dairying and butter making, firing boilers, harness making, tailoring, sewing, plastering, suspender manufacturing, base-ball manufacturing, floriculture, gardening, besides telegraphy, stenography, typewriting, manual training and instrumental music. Industrial improvement courses are needed. (3) The State Home for Girls, at Trenton. Instruction is furnished in various forms of housework, in cooking, laundering, sewing and gardening.

NEW MEXICO.

Manual Training, and Industrial Education.—No legislation. The New Mexico Normal University, at Las Vegas, includes among its departments a school of manual training for teachers. The Allison School, and elementary school for girls at Santa Fe, has classes in domestic science and dressmaking.

Territorial Educational Institutions.—(1) The New Mexico College of Agriculture and Mechanic Arts, located at Agricultural College, has four-year courses in agriculture, civil, electrical and Mechanical engineering, and household economics. Shorter courses are offered in agriculture, household economics, and practical mechanics. It receives the Federal appropriations. (2) The University of New Mexico, at Albuquerque. Department of engineering to be established soon. (3) The New Mexico School of Mines, at Socorro, offers four years' work in mining, metallurgy, and civil engineering.

Indian Schools, devoting about one half of the time of instruction to manual labor, are located at Albuquerque, Blackrock, Dulce, Santa Fe and Tohatchi.

Agriculture in the Public Schools.—While the teaching of agriculture in the public schools is not required by law, syllabi covering courses of instruction in agriculture for the elementary and the secondary schools have been issued by the State Education Department.

Manual Training.—Instruction in manual training in the public schools is encouraged. There is no special State aid. Manual training and drawing must be included in the curricula of normal schools. The latter generally teach domestic science also. In union free schools instruction in drawing is mandatory. Throughout the State, manual training has been introduced into the courses of study of the larger cities and towns. Some of the principal manual training schools are: the Stuyvesant High School (magnificently equipped), of New York City (225 East Twenty-third street); the Brooklyn Manual Training High School (L.+B., \$800,000; E., \$325,000; S., 3,086); and the Buffalo Technical High School.

Industrial Education.—The Law of 1908, authorizing State aid to industrial schools, has already been mentioned in the introduction to this chapter. It provides for two types of industrial schools, *i. e.*, general industrial schools and trade schools. The "general industrial schools" are to be open to pupils who have completed the elementary school course, or who have attained the age of fourteen years, and the trade schools are to be for pupils "who have attained the age of sixteen years and have completed either the elementary school course, or a course in the above mentioned 'general industrial school,' " or who have met such other requirements as the local school authorities may have prescribed. Each school district is required to have an advisory board of five members representing the local trades and industries "to counsel with and advise" the school authorities in relation to the industrial school or schools. The State aid to each district is to be "five hundred dollars for each independently organized general industrial or trade school (a) maintaining a course for forty weeks during the school year; (b) employing one teacher whose work

is devoted exclusively to the school; (c) having an enrollment of at least twenty-five pupils; and (d) maintaining a course of study approved by the Commissioner of education." There is to be "an additional apportionment to each city and union free school district of two hundred dollars for each additional teacher employed exclusively in the (industrial) schools for forty weeks during the school year." The moneys apportioned are to be used exclusively for the maintenance of the industrial schools. In his discretion, the Commissioner of Education may apportion to a district or city, maintaining industrial schools or employing teachers of industrial education for a shorter time than forty weeks, an amount pro rata to the time the schools are maintained or the teachers are employed. "Manual training high schools or other secondary schools maintaining manual training departments are not entitled to an apportionment of funds" under this law. The statute provides that the industrial schools must be entirely separate from the ordinary manual training schools, if the former are to receive State aid.

State Schools.—(1) Although a private foundation, Cornell University, at Ithaca, includes the "New York State College of Agriculture," which receives the Federal grants and State aid. Not only is the College of Agriculture one of the best developed institutions of its kind to be found in the country—offering a remarkable variety of courses—but Cornell University furnishes instruction in other technical departments which are as well equipped and organized as can be found in the world. The intelligent assistance of Ezra Cornell led to the realization of a large permanent endowment from the "land-scrip" donated by Congress. S., 4,465 (In Sibley College of Mechanical Engineering, 1,127; in the College of Civil Engineering, 511; in the College of Architecture, 100; in the State College of Agriculture, 348; in the short winter course in agriculture, 270). (2) "State schools of agriculture" recently have been established at Alfred University (Alfred P. O.), and at Morrisville, and at St. Lawrence University (Canton P. O.) (3) Instruction in manual training is a feature of the curricula of the State normal schools. (4) Industrial training is given in various State reform schools and schools for defectives. The trade schools of the Elmira Re-

formatory are particularly well developed. (5) A number of Indian schools receive attention from the State. It is the policy of the State Department of Education to encourage the Indian boys to learn to use tools, and the girls to learn to sew and cook.

U. S. Military Academy, at West Point (commonly called "West Point"), has one of the strongest engineering departments to be found in the country. Tuition is free. Cadets are paid \$709.50 per year each by the Government, and out of this they pay their own expenses for board, clothing and so forth. The living expenses average about \$225 per annum. The total appropriations for the support of the Military Academy by Congress the last college year was \$1,929,703. F., 90; S., 533

Private Foundations for Higher Technical Instruction.—(1) *Columbia University*, in the city of New York. This institution has important technical departments in the Schools of Mines, Engineering and Chemistry. Affiliated with the University is a Teachers' College, with departments for the training of teachers in domestic science, domestic art, manual training and kindred branches. Some evening industrial improvement and engineering courses have lately been conducted under the auspices of the University. The cost of construction of the buildings, which are used exclusively for technical purposes, was \$2,340,000; the value of equipment is \$225,000, and the total volume of these buildings is 6,183,000 cubic feet. Tuition, \$250 per annum. Enrollment in 1908: Chemical engineering, 19; chemistry, 27; civil engineering, 88; electrical engineering, 79; mechanical engineering, 62; metallurgy, 12; mining engineering, 138. First year—(uniform for all courses), 193; total, 618. S. in University and affiliated schools, 5,655. (2) *Syracuse University*, at Syracuse.—This institution has an important Teachers' College and a College of Applied Science, in which the various engineering branches are taught. S., 3,117 (in Applied Science, 393). Fees charged for instruction, \$133 per annum. (3) *The Polytechnic Institute of Brooklyn*.—The Polytechnic Institute of Brooklyn has two general departments: the College of Engineering and the Preparatory School. These departments are entirely distinct from each other, and their work is conducted in different buildings under separate direction. The

Preparatory School equips students for entrance into any American college, and for the activities of commercial life. The entrance requirements for the College of Engineering are the same as for the best technical colleges. Four-year courses are given in chemistry, and in chemical, civil, electrical and mechanical engineering. There is also a graduate course in science, leading to the degree of Master of Science. Evening technical and industrial improvement courses are carried on parallel to the day courses. The enrollment in the evening technical school is about 500, and that of the day technical course is, approximately, 185. Extension courses are also conducted. End., \$150,000; L. + B., \$750,000; E., \$75,000; M., \$150,000 (including M. for Preparatory School). The annual cost of instruction per pupil in the Technical Department is put at \$400. Fees charged for instruction in the day courses amount to \$200 per annum for each student. (4) Rensselaer Polytechnic Institute, at Troy, has a variety of well-developed technical courses. The institution has recently received a large endowment, which will permit of rapid expansion. F., 42; S., 651. (5) New York University, New York City.—This institution has a School of Pedagogy, for undergraduate and graduate work, and a technical department well equipped for the giving of instruction in a variety of engineering branches. The School of Commerce, Accounts and Finance is a highly-developed department of the University, and in connection with this division there are lectures on industrial methods, as well as courses in industrial engineering and other industrial subjects. The School of Pedagogy has given more attention to training for administrative and teaching positions in industrial schools than any other college for teachers in the country. There are more male students enrolled in the School of Pedagogy than in any other teachers' college in America. S., 4,300. (6) The Thomas S. Clarkson Memorial School of Technology, at Potsdam. The entrance requirements are equivalent to 14.4 Carnegie units, or seventy-two "counts," as established by the N. Y. State Education Department. The school has an Engineering College, with four-year courses in civil, chemical, electrical and mechanical branches. The first two years of the college course are taken in common

by all the students, the differentiation coming in the junior and senior years. Several scholarships are awarded. The cost of living in Potsdam is low. The courses formerly given in home economics have been discontinued. Tuition, \$100 per annum. End., \$500,000; L. + B., \$125,000; E., \$43,633; M., \$22,373.58; S., 97. (7) The College of the City of New York has a course in the mechanic arts. The institution is supported altogether by the municipality. Tuition is free. There is an academic department of high school grade (with a three years' course), and a collegiate department with several courses, each four years in duration. S., 4,383 (about two-thirds of the enrollment is in the academic department). L. + B., \$6,500,000. (8) Cooper Union for the Advancement of Science and Art, New York City, offers several technical courses of collegiate grade. The majority of the graduates become civil engineers. To a large extent, the instruction is of sub-collegiate type (see below).

Private Foundations of Sub-Collegiate Grade.—Under this classification industrial schools of various types—trade schools, industrial improvement schools, lower grade technical institutes and other foundations which give industrial-vocational instruction are to be listed. (1) Cooper Union for the Advancement of Science and Art. While this institution has developed largely in the direction of higher technical instruction, it has always had much of the character of an industrial improvement school, with added divisions for the industrial arts, fine arts, stenography and typewriting, and such subjects as elocution, oratory and debate. The industrial improvement side of the institution has been given great impetus since the lease of the Sixty-ninth Regiment Armory, now known as the "Hewitt Addition to Cooper Union." Notwithstanding the increase in the capacity for the accommodation of students, the institution is still unable to take care of all the applicants. This year there were 7,500 applicants for admission. Only 3,400 of these could be admitted to the classes. In 1908 the highest attendance at any one time was 2,505 (in general science course, 667; in electrical course, 114; in the chemical course, 154; in the night art classes, 1,333; in the day school, 237). Since the Cooper Union was founded, in

1854, over 100,000 men and women have attended the night classes. There is a free reading room and library in the Cooper Union building, which is visited daily by three thousand visitors. A museum of decorative art is also open to the public. Numerous extension lectures are given in connection with the institution. Endowment, \$3,870,520. (2) Pratt Institute, in Brooklyn, was established and endowed by Charles Pratt, a self-trained man and successful manufacturer, who was greatly interested in industrial education. The Institute was opened in 1887, with twelve students in the classes. In 1907-'08 there were 2,160 enrolled in the day classes and 1,662 in the evening sections, a total of 3,782 students (some are enrolled both day and evening). Over 65,000 individuals have received training at Pratt Institute. The institution is controlled by a board of trustees consisting of members of the Pratt family. Mr. Frederick B. Pratt is the Secretary and Executive Officer. The school is co-educational. There is a department of fine and applied arts, a department of domestic arts, a department of domestic science, a department of science and technology, a kindergarten and kindergarten course for teachers, a library school and a gymnasium. (a) The department of science and technology has the largest number of students (1,198). It furnishes two-year day courses for foremen in steam and machine design, applied electricity and applied chemistry, one-year day trade courses in machine construction and carpentry and building; evening industrial improvement courses in practical mathematics, technical chemistry, industrial electricity, elementary electricity and practical mechanics, electrical machinery, electrical design, mechanical drawing, machine design, mechanism, steam and steam engine, and strength of materials; and evening trade courses in carpentry and building, pattern-making, machine work, toolmaking, sheet metal work, plumbing, sign painting and fresco painting. Over two-thirds of the students in this department are enrolled for the evening courses. (b) It is the aim of the department of domestic arts to provide courses of instruction in those textile arts which are related to clothing. The instruction is devised to train assistants in dressmaking and millinery establishments, technical workers in the costume field, and women who wish to acquire

skill in the home arts. The courses require from three months to a year for completion. During the day "full-time" courses in sewing, dressmaking, millinery and dress design and pattern drafting are given to those who wish to become seamstresses, dressmakers, milliners or costume designers. Men as well as women are admitted to the classes in millinery and dress design and pattern drafting. There are also partial time day courses for those who desire greater skill in sewing, dressmaking, embroidery and millinery for practical use in the home. Evening courses are conducted in sewing, shirt-waist making, children's garments, power operating, dressmaking, drafting and draping, millinery and costume drawing. Small classes for girls have been organized to meet on Saturday mornings. (c) The department of fine and applied arts enrolled 1,035 students in the year 1908. In this department there are day courses as follows: the normal art course; normal art and manual training; general art and pictorial illustration; general art and costume illustration; decorative and applied design; architecture; jewelry, chasing and enameling. The evening classes furnish instruction in freehand drawing; life and portrait drawing; architectural drawing; ornament, design and modeling; clay and wax modeling; metal chasing, and wood carving. The courses require from two to four years, in general, for the completion of the work. There are Saturday morning classes for children in drawing, color and manual training. Diplomas are granted upon graduation from the longer courses. (d) The department of domestic science enrolled 381 students in the year 1908. Day courses are given in domestic science and elementary domestic art for teachers; in domestic science for dietitians, matrons, housekeepers, probationary nurses and homemakers, and in cookery, household economics and laundry work for homemakers and practical houseworkers. The evening classes furnish instruction in cookery, serving and laundry work. The time necessary to complete the courses ranges from attendance upon the twelve lessons in serving to that required in the two-year course for teachers. There is a Saturday morning class for young girls who wish to learn cooking. End., \$2,300-000; income, from interests, rents., etc., \$133,567.24; from tui-

tions and credits, \$100,403.30; the deficit (made up by the Pratts), \$46,886.43; L.+B.+E.= \$1,436,622.79; M., over \$280,000. The tuition fees vary for the different courses—from \$3 for a term of three months for an evening course in cooking or sewing, to \$25 for three months in one of the normal training courses. (3) The Rochester Athenæum and Mechanics' Institute, at Rochester. The Mechanics' Institute of Rochester enrolled 3,348 students in 1908. It affords both day and evening instruction in the departments of industrial arts, mechanic arts and sciences, manual training, domestic science and art, and applied and fine arts. The evening courses are chiefly of the industrial improvement type. Of the individual pupils about 3,000 were enrolled for one or a few subjects, and the others were full-course students, attending five days a week. The greater number of the students are classified in the department of domestic science and art, where they have the choice of a large variety of courses—for those who wish to become instructors or directors in industrial and normal schools, hospitals, Christian associations, clubs and the like; for the learning of practical and special cookery, sewing, dressmaking, shirtwaist-making, buttonhole-making, embroidery, millinery, and the duties of waitresses and housemaids. The day courses of the department of mechanic arts and sciences are designed to take students with a grammar school education, or its equivalent, and fit them in three years for industrial pursuits. A fourth year has also been added for those who wish to go directly from the Mechanics Institute to a college of engineering without conditions. There are evening industrial improvement courses in the department. The department of industrial arts is equipped for instruction in mechanical drawing, "municipal drafting" (for those who wish to do drafting in municipal offices), steam and gas engineering, electricity, machine design, shop mechanics and lettering. The instruction is given mainly in the evening. The department of fine and applied arts is attended for the most part by day students. The department of manual training is organized especially for the training of teachers, and the classes are much frequented. By arrangement, manual training is taught to some students of the University of Rochester. The tuitions for the various departments are from

\$5 to \$18 per year for the evening classes, and \$75 per annum for full-course pupils. L.+B., \$298,500; E., 49,009; M., \$78,000. The maintenance is derived chiefly from tuition fees and subscriptions. The State pays about \$500 annually toward the expenses of the normal department. (4 The Mechanics' Institute of the General Society of Mechanics and Tradesmen of the City of New York, located at 20 est Forty-fourth street, is purely of the industrial improvement type of industrial schools, although the growth of the institution has been so rapid (from 174 students in 1899, to 2,017 in 1909) that the mathematical sections have not been organized to suit groups of workers in the particular trades, neither have the courses in drawing been differentiated for a variety of vocations. There are evening courses only. Instruction is free to males employed during the day. In connection with the institute there is a course in carriage and automobile drafting, conducted as the Technical School for Carriage Draftsmen and Mechanics, under the auspices of the Carriage Builders' National Association. The institute is in session five nights per week from the last days of September until the second week in April (holidays excepted). The enrollment in 1908-'09 totaled 2,017 individuals, as follows: First year architectural drafting, 268; second year architectural drafting, 206; third year, 128. First year of mechanical drafting, 197; second year, 93; third year, 52. First year antique class, 81; second year, 74; class in sketching from life, 26; first year class in design, 42; second year class in design, 40; clay modeling, 72; physics, 78; arithmetic, 164; algebra and geometry, 99; workshop mathematics, 45; trigonometry, 36; applied mechanics, 36; sheet metal drafting, 41; plan reading and estimating, 148; applied electricity, 63; carriage drafting, 28. The Mechanics' Institute is installed in a magnificent building, which cost a large amount of money. The edifice contains also a library of over 100,000 volumes, chiefly technical. The maintenance of the school for salaries and other expenses, was \$21,378.43 (this does not include interest on investment, etc.) in 1908. While a few of the classes meet three nights per week, the great majority are in session but two nights weekly (some one night only), allowing two or three different groups of students to make use of the building. The re-

cent endowment, given by Mr. Andrew Carnegie, has permitted the fitting out of several additional class-rooms, so that the capacity of the school is at present about 2,300 students. Everything considered, the annual cost of instruction per pupil at the Mechanics' Institute, of New York city, may be put at something above the similar figures for the Newark Technical School of New Jersey. (5) "The New York Trade School was founded in 1881 for the purpose of giving young men the opportunity of learning a trade, and to afford young men already in the trades the chance to better themselves. The idea is to teach the trade thoroughly and economically. The results have been exceedingly satisfactory, and the growth of the school has been substantial and continuous. The trade unions have been antagonistic, and this attitude on their part has not made it easy for our graduates to secure a foothold in their trade, but those of our young men having the pluck and perseverance eventually succeed. The school is neither a charity nor a commercial enterprise. Students are required to pay a nominal fee towards their education, but the principal support of the school is derived from its endowment fund and contributions. The school aims to help young men to help themselves" (from a letter). A number of trades, principally in the building lines, are taught. The day classes are four months in duration, thirty-six hours weekly; the evening classes, three terms, six months each, seven and ten hours weekly. Entrance requirements: Ability to read and write; age 17 to 25. Since the New York Trades School was founded over fifteen thousand young men have attended the institution. During the past five years the annual attendance has averaged over nine hundred students. Enrollment in 1908, 915, as follows: Blacksmithing, 16; brick-laying, 67; carpentry, 21; electrical work, 154; fresco painting, 37; house painting, 16; sign painting, 38; pattern-making, 14; plastering, 18; plumbing, 358; printing, 33; sheet metal work, 90, and steam-fitting, 53. The work is very practical. End., \$500,000; L. + B., \$305,000; E., \$25,000; M., \$49,000. (6) The Hebrew Technical Institute, New York City. This institution is equipped for the technical education of Israelites and others of restricted means in the studies which will fit them for

success in the mechanical trades. The school was established in November, 1883. Support comes from voluntary contributions of members of the Hebrew Technical Institute Society. This organization is composed of twenty-four hundred members, who contribute from ten dollars to one hundred dollars each per year toward the support of the school. The Institute is in part a trades school, but, in some of its divisions, has the character of an industrial improvement school, a manual training school, or a polytechnic institute. Candidates for admission to the day school must be residents of New York City, at least twelve and one-half years of age, in good health and must have finished the 7 B grade of the public schools. The full course requires three years for completion. The evening classes are intended for working mechanics. Applicants must be at least nineteen years of age. There evening classes in tool-making, instrument-making, die-making, machine work, pattern-making, cabinet-making and mechanical drawing. The evening courses usually extend over a period of two years. Tuition for both the day and evening courses is free. The total number of living graduates of the school is 701. Of these, 624 recently reported to the president of the society. Seventy-seven per cent. are following mechanical work. The average weekly earnings of the seventy-three graduates of 1907 were eight dollars per week; the average weekly earnings of the nineteen graduates of the Class of 1886 were fifty dollars per week. There is a gradual increase from the wages of those who completed the course at the most recent date to the fifty-dollar wage of those who graduated in the year 1886. L. + B., \$150,000; E., \$125,000; M., \$40,000; S., 350 (in day school, 280; in evening school, 70).

(7) The Baron de Hirsh Trade School, in New York City, is a thriving institution, giving practical instruction in both the machinist's and building trades. It is one of a group of schools maintained in America and abroad through the generosity of the late Baron de Hirsch. A fund amounting to several millions of dollars was established for the purpose of furnishing needy Hebrews with employment, teaching trades, and in other practical ways assisting the members of the race. The Baron de Hirsch Agricultural School, at Woodbine, New Jersey, is like-

wise maintained from the Baron de Hirsh fund. For admission to the Baron de Hirsch Trade School preference is given to those born in Russia and Roumania. Candidates must be at least sixteen years of age. The day classes were the most popular at the outset, but instruction has been given also during the evening. About 275 pupils are enrolled in the school. Of these, somewhat less than one-half are in the elementary grades. L. + B., \$175,000; M., \$30,000. (8) The Hebrew Technical School for Girls, in New York City, has recently moved into new quarters. This institution is chiefly a commercial school, but also has important industrial improvements and trade departments. The graduates earn good wages. L. + B. + E., \$380,000; M., \$40,000; S., 385. (9) The Manhattan Trade School for Girls, located in New York City, has departments devoted to dressmaking, millinery, electric power operating, novelty work (the use of paste and glue), art, academic subjects and physical education. There are both day and evening classes. Applicants for admission to day classes must not be under fourteen or over seventeen years of age. The courses average twelve months in duration, but two-year courses are offered, and the work is outlined so that those who are obliged to support themselves can be prepared for a wage-earning position, even if they can remain but a few months. Those who have taken instruction in the operation of electric power sewing machines make the highest wages when they leave the school, according to the records. The maintenance of the Manhattan Trade School is derived from subscriptions (two-thirds) and from "trade order" sales and rent (one-third). L. + B., \$200,000; E., \$15,000; M., \$36,000 (salaries, \$26,000). The annual cost of instruction is put at eighty to one hundred dollars, but if the number of students in the school at any one time were taken into account, and the investment considered, the annual cost per student unit would be considerably higher. The enrollment October 1st, 1908, was 370. (10) Webb's Academy and Home for Shipbuilders, at Fordham Heights, in New York City, was founded and endowed by William Henry Webb, in 1889. Candidates for admission to the Academy must be of American birth, unmarried, in good health, of good moral character and of an age not less than fifteen, nor more than twenty

years. "Applicants must show that parents, or guardians, can not afford to educate them elsewhere." The courses of instruction include advanced mathematics, physics and inorganic chemistry, theoretical and practical naval architecture and marine engineering, and cover a period of four years. Diplomas are issued to graduates. Of the 104 living graduates, 50 are engaged in naval architecture and marine engineering, and 32 of the remainder are following some other line of engineering. L. + B., \$600,000. S., 45. (11) The Evening School of the Stuyvesant High School. The evening industrial department of the Stuyvesant High School has both industrial improvement and trade school divisions. At present 552 students are enrolled. The average age is about 23 to 26 years. The students are mostly of foreign descent and sixty per cent. of them are Hebrews. The average attendance, by classes, is as follows (February 15th, 1909): Cabinet-making, 7; pattern-making, 13; carpentry and joinery, 22; plumbing, 42; blacksmithing, 12; machine shop practice, 21; steam engineering, 10; electric engineering, 33; algebra and geometry, 62; shop arithmetic, 24; chemistry, 19; physics, 25; freehand drawing, 31; architectural drawing, 26; mechanical drawing, 52; electric wiring and installation, 32. (12) The New York School of Applied Design for Women, of New York City, was organized to give women the opportunity of qualifying themselves to make designs for wall papers, silks, cretonnes, chintzes, furniture, book covers, illustrations, stained glass, rugs and for other branches of manufacture involving the use of ornamental designs. The instructors are practical men and women. There is a valuable reference library in connection with the school. Tuition fees are seventy-five dollars for the year. A large number of scholarships are available. The average time to be spent in the school is two years in the elementary departments and two years in any of one of the advanced sections. The maintenance of the institution is derived from tuitions, from the dues of associate members (\$10.00) and from donations. L. + B., \$200,000; E., \$15,000; M., \$23,000; S., 441. (13) If space permitted, detailed mention should be made of the work of the Young Men's Christian Associations and of the Young Women's Christian Associations along industrial

lines; of the activities of the Washington Irving High School; of the industrial improvement and trade school work performed at the Long Island City Evening School of Trades; of the New York School of Industrial Art; of the evening trade school of St. George's Church, and the industrial work which is a part of the activities of such interesting institutions as the Brick Church; of the industrial schools of the Brooklyn Industrial School Association and Home for Destitute Children, the Five Points House of Industry and other similar institutions; of the Mitchell School of Garment Cutting and the McDowell Schools, and the manual training work performed in such institutions as the Ethical Culture School, in New York City, and "Barlow's School of Industrial Arts" (the manual training department of the Central High School), at Binghamton; of the wonderful institution known as the "George Junior Republic" of the Wilson Industrial School for Girls (New York City), and of a great many other minor institutions, which, in the aggregate, accomplish much for the promotion of either manual training, or of industrial education.

NORTH CAROLINA.

Manual Training and Industrial Education.—No State provision of a general character. The State law requires that the elements of agriculture shall be taught in all the public schools. Some of the city schools—Durham, Asheville, Wilmington, Charlotte, Greensboro and Winston were the leaders—have introduced manual training. Manual and industrial training are found in the Agricultural and Mechanical College for the White Race at Raleigh; in the State Normal and Industrial College for Women, at Greensboro; in the Agricultural and Mechanical College for the Colored Race, at Greensboro; in the State Normal Schools for Colored, at Fayetteville, Winston and Elizabeth City; in the Cullowhee Normal and Industrial School, at Painter, and in the Croatan Normal College (for Indians), at Pembroke. The difficulty of introducing manual training in the majority of the public schools of the State, "with one-room

school-houses without special equipment and with one teacher without special training on an average salary of \$30.74 per month, with barely money enough for a four months' term and for instruction in the common school branches, with more daily recitations than can be successfully conducted," is emphasized by the State Superintendent of Public Instruction in a recent report.

State Schools.—(1) The University of North Carolina, at Chapel Hill, provides instruction in engineering to a very few students. S., 790. (2) The North Carolina College of Agriculture and Mechanic Arts, at West Raleigh, furnishes instruction, in four-year courses, in the agricultural section (including agriculture, horticulture, veterinary science, biology and agricultural chemistry); in the engineering department (civil, mechanical, electrical and mining engineering and industrial chemistry), in the textile industry (including carding, spinning, weaving, designing and dyeing). Admission to the foregoing courses and to the one-year course in agriculture requires a little more than eighth grade graduation; admission to the two-year courses in the mechanic arts (including carpentry, wood-turning, blacksmithing, machine-shop work, drawing, dynamo and engine tending) and in textile industry is conditioned on passing elementary school subjects. No examinations are required for entering the winter short courses in agriculture, dairying and textile industry. Normal courses are offered, also, for the training of teachers along industrial-pedagogical lines. The varying personal needs which the institution seeks to meet is typified by the agricultural courses, which are: (a) a one-week course, (b) a seven-weeks' course, (c) a one-year course and (d) a four-years' course. Tuition, \$45 and incidentals. L. + B., \$323,900; E., \$102,260; M., \$75,739 (of this \$55,739 for salaries). Annual cost of institution, \$220. S., 436. (3) The North Carolina State Normal and Industrial College, at Greenboro, is devoted to the training of girls and women. The object of the institution, as set forth in the act establishing it, "is (1) to give to young women such education as shall fit them for teaching; (2) to give instruction to young women in drawing, telegraphy, typewriting, stenography and such other industrial arts (sic!) as may be suitable to their sex and conducive to their support and usefulness. Tuition

shall be free to those who signify their intention to teach." The entrance requirements are low. Manual training, domestic science and domestic arts are included in the curriculum. (4) The Agricultural and Mechanical College for the Colored Race, at Greensboro, shares in the Federal and State appropriations. Ent. req.: Completion of the seventh grade. The four years' course in agriculture leads to a degree (B. Agr.). Short courses (two years) in the trades and dairying. There is also a night school (industrial improvement) for those who are given work during the day to enable them to earn their way through school. The rate of pay for working students is $7\frac{1}{2}$ cents to $12\frac{1}{2}$ cents per hour. Numerous trades, for boys and girls, are taught in the institution. S., 194; M., \$31,500; tuition, \$1 per month. Some free tuition scholarships are granted, at the request of members of the Legislature. (5) The State Normals and the State Schools for Defectives are institutions which offer some form of manual or industrial training, and receive aid from the treasury of the commonwealth.

Private Foundations and Mission Schools.—Brevard Institute (for girls), at Brevard, is an elementary and high school (inclusive of tenth grade only), with the addition of courses in dress-making, millinery, housework, cooking, laundering and mending, business courses, music and normal training. Supported by missionary society, church and tuition. L. + B., \$15,000; E., \$4,200; S., 212. (2) The Industrial Institute, at North Wilkesboro, has 45 students enrolled. The course is elementary. (3) Dorland Institute, at Hot Springs, is supported by fees and church contributions. Coed. Students must be over 14 years of age. Fees, \$25 to \$48 per year; S., 182; L. + B., \$35,000; E., \$5,000; M., \$8,000. (4) The Laura Sunderland Memorial, at Concord, is an elementary school, supported by missions. (5) The Asheville Farm School, Asheville; Skyland Institute, at Blowing Rock, and Asheville Academy and Industrial School, at Asheville, are other institutions offering manual or industrial training.

Private Foundation for Colored.—(1) St. Augustine's School, at Raleigh, has facilities for giving instruction in a few trades and industries, in addition to academic courses running from

kindergarten to Greek. Board and tuition, \$8 per month; L. + B., \$120,000; M., \$29,400; S. 428 (2) Shaw University, at Raleigh; Biddle University, at Charlotte; the Joseph K. Brick School, at Enfield, are among the principal private or denominational institutions of the State giving instruction in manual or industrial work to members of the colored race, although Washburn Seminary, at Beaufort; Scotia Seminary, at Concord; Bennett College, at Greensboro; Barrett Collegiate Institute, at Pee Dee; the Albion Academy, Normal and Industrial School, at Franklinton, and Gregory Normal Institute, at Wilmington, also do something in this direction.

NORTH DAKOTA.

Manual Training and Industrial Education.—No important general State provision. In a few city schools and in the State Normal Schools manual training is found (cp., also, the State Normal and Industrial School, farther down).

State Schools.—(1) The State University and School of Mines of North Dakota, at University, includes the College of Mechanical and Electrical Engineering, the College of Mining Engineering and Teachers' College in its group of faculties. It also has a course in civil engineering and a model high school (connected with Teachers' College), in which courses in manual training and mechanical drawing are offered. Manual training courses may be elected by students in the College of Liberal Arts. The College of Mining Engineering received a Federal grant of 40,000 acres. Univ. S., 861. L. + B., \$500,000; E., \$125,000; M., \$146,457. Cost of institution, \$170.10 annually. Ent. req.: Fifteen Carnegie units. Tuition free, except for law course. (2) The North Dakota Agricultural College, at Agricultural College, has undergraduate courses in agriculture and civil and mechanical engineering, with short courses in farm husbandry, agriculture, steam engineering and domestic science. A three years' course for the training of teachers in the elements of agriculture and the mechanic arts is also offered. Land grant endowment valued at \$1,300,000. Income: From Morrill fund, \$30,000; land grant, \$44,422; State tax, \$33,678; fees,

etc., \$11,625. L. + B., \$337,795; E., \$66,065; M., \$119,726. Ent. req.: Eighth grade graduation. Regular courses, 4 years in duration. S., 988. (3) The State Normal and Industrial School, at Ellendale.—Organized as the State Manual Training School in 1899. Name changed in 1907. "Its purpose is to offer young men and women opportunity to secure a liberal education; to train teachers to serve in the public schools, and to afford adequate and systematic training in the commercial, artistic, domestic and mechanical industries." Has a "normal" and an "industrial" department. Ent. req.: to normal department, completion of eighth grade; to industrial department, completion of seventh grade. Three normal courses of four years and one of a single year (for teachers in common schools); industrial department courses in mechanic arts, steam engineering, printing and farm engineering, besides commercial arts, home economics, fine arts, library economy and music—each four years. In the industrial department 186 points' credit are required for graduation, of which 123 must be in academic subjects and physical training (plus 6 points in military science, for young men); the remaining points to be elected. Graduates from the mechanics' arts, home economics, or fine arts courses receive a State life certificate entitling the holders to teach the special subject in the schools of the State. The school has 40,000 acres of land. B., \$100,000; M., \$40,000 to \$50,000; S., 273. No fees. Cost of inst., \$190 to \$200 annually. (4) The State School of Science was established at Wahpeton, and offers the first two years of college courses in civil, electrical and mechanical engineering, besides more elementary work. S., 207. (5) A State School of Forestry, to be known as the North Dakota School of Forestry, is projected for Bottineau. "The object of the School of Forestry shall be to furnish the instruction and training contemplated in an agricultural high school, emphasizing those subjects that have a direct bearing on forestry and horticulture." *School for Deaf and Dumb*.—The State School for the Deaf and Dumb, located at Devil's Lake, has an industrial department, where the boys are taught printing and carpentry, and the girls, housework, sewing and dressmaking.

Indian Schools.—Indian schools offering manual work are located at Elbowoods and Fort Totten.

Manual Training and Industrial Education.—The State laws relating to these subjects are merely permissive in character. Manual training is taught in the schools of the principal municipalities, and in some of the smaller towns. Cleveland has a magnificent and costly new technical high school. (L.+B., \$550,000; E., \$75,000; S., 662). In the Jewish Orphan Asylum, at Cleveland, manual training is taught to pupils who are almost exclusively of elementary grade. Cincinnati has its celebrated Ohio Mechanics' Institute (see below) and its Technical School. The Y. M. C. A. has built up strong industrial improvement (and trade) classes, especially at Cleveland, where it also has a School of Navigation. At Cleveland the Y. W. C. A. gives industrial instruction. In the Old Soldiers' and Sailors' Orphans' Home, at Xenia, manual training and some industrial branches are found.

State Schools.—Ohio has three institutions which are reckoned as State universities—Miami, Ohio and Ohio State—but the school receiving the Federal appropriations for agriculture and the mechanic arts is Ohio State University, located at Columbus. It was established, originally (Act of 1870), as the "Ohio Agricultural and Mechanical College." The title was changed by the Legislature in 1878. Of especial interest, in connection with this memorandum, are the College of Education, the College of Agriculture and Domestic Science and the College of Engineering—departments of the university. In the College of Education there are four years' courses in arts, domestic science and manual training, for teachers, besides the general course. A four years' course in agriculture, in horticulture and forestry and in domestic science; a two years' course in agriculture and in horticulture, and winter courses in agriculture and in dairying are scheduled in the College of Agriculture and Domestic Science. Four-year courses in architecture, ceramics (leads to degree of Ceramic Engineer—Cer. E.), chemical, civil, electrical, mechanical and mine engineering, industrial arts and manual training, in addition to two-year courses in clay-working, industrial arts and shopwork and mining are offered in the Col-

lege of Engineering. Total S. in Univ., 2,686. (2) Ohio University, at Athens, receives State aid, annually, to the amount of about \$94,000, and approximately \$15,000 from other sources. Special appropriations are not included in the foregoing. Included in its faculties are the State Normal College (with two and four years' courses), and departments of civil and mechanical engineering. L. + B., \$1,000,000; E., \$75,000; M., \$123,200 (of this \$56,627 for salaries); S., 1,386. (3) Miami University, at Oxford, has a department for teachers, with instruction in domestic science and allied branches, but is not equipped for instruction in engineering. (4) The Ohio State School for Blind and the Ohio Institution for the Education of the Deaf and Dumb, at Columbus; the Ohio State Reformatory, at Mansfield; the Girls' Industrial Home (reform), at Delaware, and the Boys' Industrial School (reform), at Lancaster, are institutions in which forms of manual training, or industrial education, are found.

Municipal University.—(1) The University of Cincinnati maintains a college for teachers and a strong engineering department, with four-year courses in civil, mechanical, electrical and chemical engineering. In addition, there is the so-called "co-operative course." Students enrolled in this course spend alternate weeks in the engineering college and in the manufacturing shops of the city. There are two sections in the class which alternate, so that when one group is at the shop the other is at work in the college. The course takes six years. Students work full time at the shops during the summer, but have several weeks' vacation from the school; also a week off at the Christmas season. The course was made possible through the co-operation of over forty Cincinnati manufacturers. The local machine industries are peculiarly adapted to the success of the plan. The students are paid a scale of wages which begins at ten cents per hour, and is increased at the rate of one cent per hour every six months. The total earnings during the course are about \$1,800. The first year of the Cincinnati trial 28 students undertook the plan; the second year, 44. This year there were nearly two thousand applications. Only a small proportion of these could be accommodated. Put into successful operation by Dean Herman

Schneider, the co-operative plan has been introduced, in a modified form, into Lewis Institute, Chicago (cp., *Illinois*), and the schools of Fitchburg, Massachusetts. University source of support, annually; from municipal appropriations, \$139,000; from proceeds of endowment, \$50,500; from student fees, \$52,000; total (including miscellaneous), \$255,000; endowment, \$1,500,000; L.+B., \$1,700,000; E., \$100,000. Each graduate costs about \$1,900; including students that never finish the annual cost per pupil is about \$210. In professional departments, tuition of \$75 to \$125 annually is charged. In arts and letters and pure sciences, tuition is free to citizens of Cincinnati. It is announced that the preparatory technical department of the university will be discontinued. For admission to the colleges 16 units are required. S., 1,264 (174 in engineering).

Private Foundations.—(1) The Ohio Mechanics Institute, at Cincinnati, founded in 1828, was incorporated by a private society. Any reputable citizen above the age of 21 years may belong to this society upon the payment of an annual fee of \$3, or \$50 for life membership. Maintenance is derived from memberships, from the interest (at 4 per cent.) on the endowment of \$350,000, and from nominal tuition fees, amounting to about \$36,000 annually. The institute is not an industrial improvement school alone. It has a "technological high school, with regular four-year courses in mechanics, architecture, science and industrial art, an evening industrial improvement school with a variety of courses (organized in 1856-'57—22,000 students have received instruction in this department), Saturday courses (9 A. M. to 12 M.), and a summer school (six weeks). There are no special requirements for entrance, except for admission to the high school, which is of the usual grade. S. in summer school, 267 (81 of these in elementary manual training); in Saturday class, 24; in the high school, 370; in the evening school, 1,092; total, without duplication, 1,345. L.+B., \$400,000; E., \$75,000. (2) Case School of Applied Science, in Cleveland, is an institution of full college rank, requiring high school graduation, or the equivalent, for admission. The courses are four years in length in civil, railroad, structural, mechanical, electrical, mining and metallurgical engineering and in physics and chemistry.

The degree of Bachelor of Science is conferred. By agreement between the school and Adelbert College, students entering Adelbert College may complete the courses in both institutions within five years. Three of these are to be spent at Adelbert College, and the last two at Case School. Endowment, \$2,300,000; L.+B., \$850,000; E., \$175,000; M., \$100,000; S., 440; fees for instruction, \$100 per annum. (3) Several colleges in Ohio not mentioned in the foregoing paragraphs, support departments for the training of teachers, and in connection therewith give instruction in sub-industrial branches, and one of them—Wilberforce University, at Wilberforce, for colored students of both sexes—has a considerable industrial department. Total S., 422.

OKLAHOMA.

Manual Training and Industrial Education.—No State aid for manual training. This branch is taught in a few city schools "The elementary principles of agriculture, horticulture, animal husbandry, stock feeding, forestry, building country roads, and domestic science, including the elements of economics, shall be embraced in the branches taught in all the public schools of this State receiving any part of their support from this State, and these branches shall be as thoroughly studied and taught by observation, practical exercises and the use of text and reference books and in the same manner as are other like required branches in said public schools" (School Laws, 1908). In order to carry out the provisions of the State Constitution relating to the teaching of the elements of agriculture, horticulture, stock feeding and domestic science in the common schools of the State, a "State Commission for Agricultural and Industrial Education" was created by the Legislature of 1908 (the Franklin Act, approved May 20). It consists of the State Superintendent of Public Instruction, chairman; the President of the State Board of Agriculture and the President of the Agricultural and Mechanical College. The commissioners serve without additional pay. An annual report to the Governor is required. After July 1st, 1909, no person is to be allowed to teach in the public schools of the State who has not passed a satisfactory examination in the ele-

ments of agriculture and allied branches, as required by the paragraph cited as above. In each of the State normal schools a department to be known as the "Department of Agricultural and Industrial Education" is established, and a yearly appropriation of \$2,500 ("or as much thereof as may be necessary") out of the State treasury is made to each of the State normal schools for the maintenance of this department. The Agricultural and Mechanical College is designated by law "the head of the agricultural, industrial and allied science system of education." The "Chair of Agriculture for Schools" is created in the Agricultural and Mechanical College. The duty of the incumbent is "to direct and advise in all matters relating to the teaching of agriculture and allied subjects in the common schools, under the supervision of the President of the Agricultural and Mechanical College." He is to visit normals, institutes and public schools, and prepare, print and distribute such leaflets and other literature as may be helpful to teachers. Graduates of the four-year course in the Agricultural and Mechanical College are granted a permanent teacher's certificate of first grade by the State Superintendent of Public Instruction, when application is approved by the Commission for Agricultural and Industrial Education. The Commission prepares courses of study in the subjects concerned for the public schools (the creation of district agricultural schools has been mentioned in the introduction of this chapter). An experimental farm must be operated by each of the district agricultural schools. A farmers' short course, extending over at least one week, must be held annually in connection with each district agricultural school. No tuition may be charged for such courses, and no entrance examinations required, and all white citizens over fifteen years of age are entitled to admission. The appropriation for each of the first two district agricultural schools to be established was \$20,000 for the erection of buildings, with an additional \$12,000 per annum for maintenance. One-fourth of the sum appropriated for maintenance must be expended in developing agricultural experiments. The first agricultural school under the new law was established at Tishomingo, and the second at Warner. Each locality furnished a building free of rent until such time as the new structure might be completed. The people

of Warner gave 160 acres of land; the residents of Tishomingo furnished 100 acres and a contract for free light and heat for a period of years.

State Schools.—The State University of Oklahoma, at Norman, has a School of Applied Science, in which civil, mechanical and electrical engineering are taught, and a School of Mines, for instruction in mining engineering. The University is endowed with lands valued at \$3,670,000. Total S. in University, 790. (2) The Oklahoma Agricultural and Mechanical College, at Stillwater, receives the Federal aid. For admission to sub-freshman year of five-years courses, eighth grade graduation is required. Degree of B. S. Agriculture; general science; science and literature; civil, electrical and mechanical engineering are the six regular courses. Short courses are taught. There is trade instruction in printing, and correspondence courses in agriculture, the latter especially for teachers. S., 581 (of these 136 in preparatory class). Fees are nominal. M., \$55,000 to \$60,000. (3) The Colored Agricultural and Normal University, at Langston, receives Federal aid. Several trades are taught. Electrical and mechanical engineering, agriculture and architecture are the titles of some of the longer courses. S., 355, mostly in the preparatory department. The school was richly endowed with Federal lands.

Indian Schools.—Indian schools in which some manual or industrial work is given are Murrow Indian Orphans' Home, Atoka; Chilocco Agricultural School, Chilocco; Seger Colony School, Colony; Arapaho Training School and Cheyenne Training School, Darlington; Red Moon School, Lawton; Orage Indian Training School, Pawhuska; Ponca Training School, Whiteeagle; Seneca Training School, Wyandatte; Pawnee Training School, Pawnee; Shawnee Training School, Shawnee.

OREGON.

Manual Training, and Industrial Education.—Local boards may direct that all or a part of the two years of optional work in the high school may be devoted to manual training. Also, any school board may establish a department of industrial training in

connection with local high school. No State aid. (1) The Portland School of Trades. Under the direction of the Board of Education. Established in 1908 (September). Follows the experiment inaugurated previously by several other American schools, notably Springfield, New York City (Brooklyn, Long Island City and Manhattan), Hartford, Cambridge, Milwaukee and Philadelphia, and recently by Cleveland. Machine shop practice, plumbing, electrical construction, woodwork (including carpentry, pattern-making and cabinet-making), and mechanical and architectural drawing are taught. English, mathematics, applied physics and industrial chemistry also included in the course, which is three years in duration. By December 16th, 1908, 125 pupils had enrolled. Entrance requirements: any male graduate of the grammar schools, or any boy fifteen years of age who is not a graduate of the grammar schools may be admitted. The institution occupies a recently constructed annex to a regular school. The equipment is costly.

State Schools.—(1) The University of Oregon, at Eugene, includes in its curriculum courses in civil, electrical, mechanical, mining and chemical engineering. No tuition, but incidental fee (\$10). Admission, 15 units. F., 105; S., 714 (105 in engineering). Cost of instruction, \$200 per pupil, annually. (2) Oregon Agricultural College and Experiment Station (Corvallis). Four-years course, leading to degree of bachelor of science; agriculture, including degree courses in animal husbandry, dairy husbandry, horticulture, poultry husbandry, veterinary science, agricultural chemistry, bacteriology, and entomology, forestry, domestic science and art; civil, electrical, mechanical and mining engineering; commerce and pharmacy. "Elementary industrial courses" ("strictly vocational") offered this year for the first time; two years' courses in agriculture, forestry, mechanic arts, domestic science and art, and commerce. These are sub-freshman courses. Also are given the following winter courses: 10 weeks in dairying; 6 weeks in horticulture, in mechanic arts, in domestic science and art; 6 weeks for forest rangers; two weeks in creamery practice, and a "farmer's week." F., 78; S., 1,156 (1908-'09, nearly 1,500). Tuition free. Normal entrance and incidental fees. A professorship in industrial pedagogy has been estab-

lished. Extension work is carried on in over fifty institutes annually. The railroad companies co-operate with the college by furnishing free transportation to extension professors. At times they also provide a "demonstration train" for institute purposes. Live stock, farm machinery, and other illustrative material was taken on the demonstration train of November, 1908, which visited southern Oregon. (3) The State normal schools (Monmouth, Drain, Weston and Ashland) of Oregon are receiving new impetus along the line of manual training and domestic science. (4) The Oregon Institute for the Blind, the Oregon School for Deaf Mutes and the Oregon State Reform School, all located at Salem, furnish training in a variety of trades.

Indian Schools are found at Chemawa (Salem Training School), Klamath Agency, and Siletz.

PENNSYLVANIA.

Agriculture in the Public Schools.—Not required by law. The statistical reports show that agriculture is taught in over 350 schools throughout the State. There are three hundred township high schools in Pennsylvania, and these institutions are being encouraged to introduce the study of agriculture, domestic science, and manual training. The State aids in the maintenance of summer schools at Ebensburg, Pocono Pines, and Mt. Gretna, and at each of these schools "an opportunity is given to those who wish to learn what can be done in teaching the elements of agriculture without an expensive equipment" (cp. *New Jersey*—courses at Cape May.)

Manual Training.—Whenever the school directors or controllers of any city of the Commonwealth are requested by fifty or more taxpayers to establish and equip "night schools for the manual training of children above the age of twelve years," they shall do so and keep the same open as many months in the year as day schools are kept open in the city. However, when the average attendance falls below fifteen, nightly, the board may close the school for the remainder of the term (Law of 1901). Reports show that manual training was taught in 530 schools of the State, altogether, in 1907. Sewing was taught in 482 schools;

cooking in 187. Not all of the State normal schools have courses in manual training. At Girard College (Endowment, \$24,467,-770), manual training has an important place in the curriculum. The will of the founder did not provide specifically for vocational training, but directed that the boys should be "bound out to learn trades when they leave the institution." Some of the best-equipped manual training schools are as follows: (1) Northeast Manual Training High School, Philadelphia. Admission requirements, eighth grade graduation. The course is three years in extent, and all take exactly the same work, except in modern languages. There are four periods per week in drawing, and eight in some form of manual training, throughout the term. S., 1,055. Tuition, free. L., \$425,000; B.+E., \$375,000; M., \$84,400. Cost of instruction per pupil, \$125-\$150 annually. The record of the graduates is extremely creditable. (2) The Central Manual Training High School, Philadelphia. "The object of a manual training school is the education of all the faculties and not the training of any special group. The boy is trained æsthetically, mentally, and physically. * * It is not the purpose of this school, therefore, to produce mechanics any more than it is to produce any other class of specialists." (statements of the Principal). Eighth grade graduation required for admission. The course of study covers three years. L.+B., \$60,000; E., \$25,000; S., 793. Annual cost of instruction per pupil, \$125 (considering investment). A large percentage of the graduates of the manual training high schools of Philadelphia continue their work in higher institutions. (3) The C. M. Schwab Manual Training School, at Homestead. "Mr. Schwab purchased the equipment for carpentry, woodturning and mechanical drawing for starting work in the basement of a ward school, in 1889. This proved so popular with the pupils and parents that Mr. Schwab erected a fine four-story brick and stone building, which cost about \$100,000, with equipment. This he presented to the people of Homestead" (D. W. McKenney, in a letter). The institution is maintained by the public school tax. All pupils in the sixth, seventh and eighth grades of the elementary school, and the first two years of the high school, take manual training and domestic science—the grade pupils three hours per week, and the high school pupils six hours per week.

(4) The Scranton Technical High School enrolls nearly 650 pupils.

Industrial Education.—No provision in the laws of the State.

State Schools.—(1) The Pennsylvania State College, at State College (Centre county), receives the Federal grants. The usual United States Experiment Station is an adjunct of the College. Entrance requirements, 14 units. Four-year courses in civil, electrical (large enrollment), mechanical, sanitary, and electro-chemical engineering; in agricultural chemistry, agronomy, animal husbandry, biology, chemistry, dairy husbandry, forestry, horticulture, industrial chemistry, mathematics, mines and metallurgy, physics, and plant pathology. There is a preparatory, or sub-freshman class, also. Seven short courses are given—five in agriculture, one in mining, and an elementary course in mechanics. Short courses are usually twelve weeks in length. The “farmers’ week” permits of a course of lectures and practical talks, attendance being optional with any citizen of the State. A very successful section of the College is the department for correspondence courses. Thirty-one courses are given, each consisting of from four to nine lessons. Students may enroll at any time. Last year 5,050 individuals were registered for the correspondence classes. The courses, with the number of lessons devoted to each, are as follows: Plant life (9); tile drainage (5); farm bookkeeping (5); the silo and ensilage crops (5); grain crops (7); clovers and grasses (7); tubers and roots (6) commercial fertilizers (7); farm manures (7); principles of breeding (8); swine husbandry (7); the breeds of horses (6); sheep husbandry (8); stock feeding (8); beef production (7); poultry husbandry (9); propagation of plants (9); principles of fruit growing (6); insects and insecticides (6); vegetable gardening (9); milk and its products (7); dairy bacteriology (7); butter making (7); dairy breeds of cattle (7); dual purpose breeds (5); cheese making (7); principles of cooking (8); house furnishing (8); the art of canning and preserving (8); heating and ventilating (7); bee keeping (9). The land grant and other endowment funds amount to \$517,000. L. + B., \$1,405,499.92; E., \$150,000; M., \$530,000. Number of students (exclusive of those

in correspondence classes), 1,151. (2) The State normal schools. In Pennsylvania they are in reality private foundations, but receive State appropriations. Facilities for instruction in manual training and domestic science are afforded by the better institutions. Many of the normal schools offer extended business courses, a situation not paralleled in other States. (3) Pennsylvania has numerous schools for defectives, and institutions for reform. They are generally well equipped for the teaching of trades.

Government Indian School.—The United States Indian Industrial School (commonly known as “Carlisle”), at Carlisle, enrolls over a thousand pupils of both sexes, a great majority of them in the elementary school. Although there is an academic and normal training department, the principal attention is paid to the trade school division of the institution. (For further information, cp. “Introduction,” or send to the Superintendent for booklet entitled “This is Carlisle.”)

Private Foundations.—(1) The University of Pennsylvania, at Philadelphia, offers courses (in the Towne Scientific School) in architecture, and in civil, mechanical, electrical, and chemical engineering. About one-fifth of the total number of students (4,500) are enrolled for these subjects. (2) Lehigh University, at South Bethlehem, has a “School of General Literature” (with classical and Latin-scientific courses), as well as a “School of Technology,” but, if measured by the attendance, it is almost exclusively an engineering college. There are courses in civil, mechanical, metallurgical, mining, electrical, and chemical engineering, and in electrometallurgy, and chemistry. A one-year course in electricity is also given. The record of the graduates of the University is a remarkable showing. Tuition: \$60 in School of General Literature; \$100 for course in chemistry; \$150 for technical course. S., 698; L. + B. + E., about \$2,000,000; M., \$180,000 (nearly two-thirds of this is returned in the way of tuitions—the balance is obtained from the endowment, and gifts. (3) The Western University of Pennsylvania, at Allegheny, has courses in mechanical, civil, electrical, chemical, and mining engineering. (4) Lafayette College, at Easton, furnishes instruction in civil, mining, electrical, and chemical engi-

neering. (5) Pennsylvania Military College, at Chester, offers civil and mining engineering. (6) Swarthmore College, at Swarthmore, has students in civil, electrical, and mechanical engineering. (7) Villanova College, at Villanova, gives instruction in mechanical engineering. (8) Allegheny College, at Meadville, has a course in civil engineering. (9) Washington and Jefferson College, at Washington, gives a course in civil engineering. (10) Engineering subjects are taught in Temple University and in Drexel Institute, at Philadelphia; also in the Carnegie Technical Schools, at Pittsburg (see below).

Private Foundations Furnishing Industrial Instruction of the Trade or Industrial Improvement Types.—(1) The Carnegie Technical Schools, at Pittsburg. They are under the control of a committee of the Board of Trustees of Carnegie Institute. The institute comprises, also, the Carnegie Library of the City of Pittsburg, art galleries, a museum, and music hall. The technical schools are located on a site containing thirty-two acres of land, adjoining Schenley Park, near the Carnegie Library and Institute building, and at the geographical center of the city. The schools are four in number—the School of Applied Science, the School of Applied Design, the School for Apprentices and Journeymen, and the Margaret Morrison Carnegie School for Women. The first school was opened in 1905. Other buildings are being added from time to time. Beginning with a gift of one million dollars, Mr. Andrew Carnegie soon increased the endowment of the schools to four millions. Students are not admitted under the age of sixteen years. Tuition fees are nominal—for the day courses, usually \$20 annually for residents of Pittsburg, and \$30 for others; and in the night schools, \$5 to \$7 per year. (a) In the School of Applied Science there are courses for both day and evening students. They include chemical, civil, mechanical, metallurgical, and mining engineering practice. Candidates for a diploma must complete a regular outline of study which approximates 3,500 lesson hours. Each student must carry a schedule of at least twenty-two hours per week. The length of the course is indeterminate, and depends upon the ability of the student. Candidates for entrance are required to pass satisfactory examinations in four of the following subjects: algebra through quad-

raties, plane geometry, solid geometry, English (spelling, grammar, composition), and high school physics or high school chemistry. It is impossible for anyone to complete the work in less than three years, unless he enters the school with advanced standing. The courses of study offered in the night school are identical with those given during the day. Preparatory night courses are also given, either at the rate of two nights, or of four nights per week. It is the night schools which are most largely attended.

(b) The School for Apprentices and Journeymen offers three distinct groups of courses—day industrial courses, and night industrial improvement and trade courses for apprentices; and night industrial improvement and trade courses for journeymen. During the year 1908-'09, two-year day courses were offered in mechanical drafting, stationary engineering, the machinery trades. The day school is in session six hours a day for five days a week, or approximately eight hundred hours in the year. The length of the courses would ordinarily be two years. In the night industrial improvement and trade courses, attendance is required on three evenings of each week. Courses are offered to apprentices in the following trades: machinery trades—machine work, patternmaking, blacksmithing and forging, molding and foundry work; in the building trades—plumbing, bricklaying, electric wiring, sheet metal and cornice work, house painting, hard-wood finishing and graining, and sign painting. Courses for other trades are to be added. The night courses for journeymen require less practical work than the courses for apprentices, and more time is devoted to the study of drawing, mathematics, and the theory underlying the trades. (c) The School of Applied Design provides instruction in architecture and interior decoration. Courses are to be organized in various branches of the arts. Night instruction is afforded. (d) The Margaret Morrison Carnegie School for Women furnishes instruction for the training of women in specialized vocations. There are technical and special day courses; and special and trade or industrial improvement courses are given at night. Specialization is offered in the departments of household arts, dressmaking, costume design, and secretarial work. Night courses are offered in sewing,

millinery, designing and embroidery, and cooking, besides stenography and bookkeeping. S., \$2,000. (2) Temple University, at Philadelphia, gives courses in civil and mechanical engineering—especially designed for those who are at work during the day. For girls and women there are courses in dressmaking, millinery, cooking, domestic science and domestic art. The evening department is in session every week day from 7 to 10 P. M. Students attend classes two evenings a week, or oftener, according to the needs of the course. S., 3,475. (3) Drexel Institute of Art, Science and Industry, at Philadelphia, was founded in 1891. "The chief object of the institute is the extension and improvement of industrial education as a means of opening better and wider avenues of employment to young men and women." The institution is co-educational, and there are both day and evening courses, lasting from one year to three years. Some students spend five years in successive departments. Night courses are six months in length. Along with other subjects, courses are offered in the following branches: Architecture, electrical, mechanical, civil and steam engineering, mechanical drawing, applied electricity, shop work in wood and iron, building construction and machine construction, surveying, telephony, household science and economics, sewing, dressmaking, millinery, shirtwaist-making, photography, domestic arts, clay modeling, wood carving, design and decoration. Fees range from five dollars to one hundred dollars per term. Endowment, \$2,200,000; M. is derived from endowment and students' fees exclusively. L.B., \$1,500,000; E., \$200,000 (this valuation does not include the picture gallery, library and manuscripts, which may be placed at nearly \$1,000,000). Enrollment in regular departments and evening courses, 2,800. Free public lectures are given annually to an aggregate of 30,000 individuals. (4) The Williamson Free School of Mechanical Trades (P. O., Williamson School) is located about sixteen miles from the Broad Street Station, Philadelphia. It was founded in 1888 by Isaiah V. Williamson. A farm of 230 acres and over two dozen buildings are devoted to the use of the school. Clothing, board and instruction are entirely free. The trades taught are: carpentering, bricklaying (including range, furnace and boiler setting, etc.), machine trade

in all its usual details, pattern-making, steam and electrical engineering and steam-fitting. Each pupil undertakes a single trade, together with instruction in the theoretical subjects bearing upon that trade, and such purely academic subjects as are required. Admission is in April. The term lasts throughout the year, with short vacations. The course is about three and one-half years in length. Pupils are indentured to the trustees after a short trial, the apprenticeship lasting throughout the course. Candidates are admitted only between the ages of 16 and 18 years, and the entrance examinations cover the branches taught in the elementary schools. The institution has more applicants than can be accommodated, hence preference is made in the following order: (a) Those born in Philadelphia, (b) in Bucks county, Pa., (c) in Montgomery and Delaware counties, Pa.; (d) elsewhere in Pennsylvania, (e) in New Jersey, (f) elsewhere in the United States. For some years the admissions necessarily have been confined to applicants from Pennsylvania. The students are grouped into cottage families of 24. The time of instruction is about equally divided between the school and the shop at first, but gradually the shop receives a larger percentage of attention. The entire sessions last eight hours on five days of the week and three hours on Saturday. About 650 pupils have been graduated. The largest number was composed of the machinists; next, the bricklayers; then, carpenters, patternmakers and stationary engineer, in the order given. Endowment, \$2,500,000; L.+B., \$600,000; M., \$100,000; S., 225. (5) The School of Industrial Art of the Pennsylvania Museum, at Philadelphia, has two divisions, the School of Applied Art—largely devoted to practical design—and the Philadelphia Textile School, which is at once a trade school and a technical school for the textile industry, as these aims are really merged in that industry. The school was the outgrowth of an awakened interest in industrial art education, due to the Centennial Exhibition, and was opened in 1877-'78. Mr. Theodore C. Search, "the father of industrial art education in America," and Dr. Leslie W. Miller, the director, have been most responsible for its growth and success. The vast influence of this institution upon industrial art in this country is beyond computation. There are day classes, as well as the

evening classes, for those who are employed during the day. The School of Applied Art comprises the departments of drawing, applied design, normal art instruction, woodwork and carving, decorative painting, illustration, decorative sculpture, architectural drawing and design, metal work and pottery. The Philadelphia Textile School has the following departments: Fabric structure and design, cotton, wool, worsted and silk, warp preparation and weaving, colored harmony and figured design, chemistry, dyeing and printing, wool yarn manufacture, worsted yarn manufacture, cotton yarn manufacture, hosiery knitting and finishing. The Legislature makes an annual appropriation to the School of Industrial Art, and the various counties of the State are entitled to free scholarships. Other scholarships are also established. Forty-seven different occupations were represented by the 1,039 students in the schools last year. Usually a grammar school education is required of those who enter. The courses are generally from two to four years in length. Endowment, \$100,000; L.+B., \$2,000,000 (including Museum); E., \$100,000; M., \$100,000; S., 1,039; cost of instruction, about \$80 annually. (6) The Hebrew Education Society of Philadelphia conducts an evening trade school (with industrial improvement and academic departments also) at Tenth and Carpenter streets. Instruction is given in cigar-making, power operation of sewing machines, plumbing and gasfitting, cutting of men's garments, dressmaking, millinery, telegraphy and mechanical drawing. The industrial classes are largely attended. (7) The Franklin Institute was established in Philadelphia in 1824. Its objects are "the promotion and encouragement of manufactures and the mechanic arts." The Institute is supported by membership fees. Lectures are given on the arts and the application of the sciences to them, and they are largely attended. The Institute maintains an evening drawing school, a school of machine design and a school of naval architecture. The sessions are from the middle of September to the first of May. A grammar school education is usually required for entrance, and the courses are four terms, or two years in length. The tuition charge is merely nominal. Nearly two thousand individuals have completed the

courses. Ordinarily, some six hundred students are in attendance. L. + B., \$60,000. (8) Avery College, at Allegheny, maintains courses in millinery, dressmaking, domestic science, tailoring and the training of nurses. Entrance requirements: An examination in seventh grade studies, maintaining an average of eighty per cent. L. + B., \$160,000; E., \$75,000; M., \$18,000; end., \$150,000; S., 465. (9) Spring Garden Institute, at Philadelphia. Conducts day and evening classes. Freehand, mechanical and architectural drawing, wood and metal turning, design and applied electricity are the most popular subjects taught. Nearly three thousand individuals have graduated from the institution since its incorporation in 1851. The school is almost entirely of the industrial improvement type. As at the Franklin Institute, there is an important reference library containing works on technical subjects. (10) The Philadelphia Trades School. This institution is carried on in connection with the public school system of the city. It was opened in September, 1906, and was installed in an abandoned school building. There are both day and evening courses. In the day courses one-half of the thirty school hours in the week are spent in the shop work of the trade selected, and one-half are given over to the study of English, mathematics and drawing. Instruction is offered in carpentry, architectural drawing, mechanical drawing, electrical construction, pattern-making and printing. Master mechanics are employed as shop instructors. The course covers a period of three years, and a diploma is given for the satisfactory completion of the work. In the evening school the following additional trades are taught: Bricklaying, plastering, plumbing, pipe-fitting, sheet metal working and house and sign painting. On account of the heavy enrollment the evening course has been so arranged that two groups of students work in each school—attending on alternate nights. There are no academic courses in the evening school. Some of the output of the trade work is sold. The net cost of instruction per pupil is put at \$64.25 for the day school, and somewhat less in the case of the evening school. This does not take into account the investment. The average age of the day school students is sixteen years and six months; the average age of the evening stu-

dents is twenty years. Eighth grade graduation is required for entrance. S., 846 (225 in day school; 621 in evening school). (11) The Y. M. C. A. industrial improvement and trade school classes, of Philadelphia, enroll several hundred students in a variety of industrial courses. The attendance in the industrial improvement courses is increasing rapidly. (12) The Philadelphia School of Design for Women has over one hundred fifty students in the industrial arts and fine arts courses. (13) The McDowell Dresscutting, Dressmaking and Millinery Schools, in Philadelphia, as in other cities, gives short-term instruction (from one week to three months) in the subjects mentioned. (14) The International Correspondence Schools, at Scranton, have a comprehensive organization. The capital of the company is \$6,000,000. The claim is made that since the incorporation of the schools one million one hundred thousand men and women have studied under their instructors; that the proprietors of the schools have expended one million five hundred thousand dollars in the preparation of textbooks and more than \$500,000 on school buildings. The floor space of the buildings, at Scranton, is about seven acres. The recent development of industrial improvement schools and of inexpensive correspondence courses conducted by colleges and universities has furnished strong competition for the Scranton organization. (15) The Tidioute Industrial School, at Tidioute, has some manual work of secondary grade.

Schools for Colored.—(1) Lincoln University, at Lincoln University, and the Institute for Colored Youth, at Cheyney, are schools for members of the colored race. They afford some industrial training.

RHODE ISLAND.

Manual Training, and Industrial Education.—No general State provision. In the principal cities and towns manual training is taught. Some evening industrial improvement courses are given, but the State is without trade schools. (1) The Technical High School of the City of Providence was provided, in 1892, with a building costing \$150,000. In 1905, the city council voted to

enlarge the establishment, increasing the capacity from 300 to 1,000. The additions were completed in 1908. L. + B., \$250,000; E., \$100,000; M., \$46,000; S., 800 (of these, 200 are girls). Free tuition to residents; non-residents pay \$160 per annum. Annual cost of instruction, \$75. (2) The Townsend Industrial School, at Newport. A manual training (not industrial) school—work in four upper grades of the elementary school (required), and throughout the high school (optional). Part of public school system. Privately endowed, \$25,000. Shares in appropriations of city schools. S., in elementary school: boys (slöyd), 528; girls (cooking and sewing), 606. S., in the high school: boys (shopwork and drawing), 72.

State Schools.—(1) The Rhode Island College of Agriculture and Mechanic Arts, at Kingston, offers four-year courses in agriculture, engineering (electrical, highway, mechanical, chemical), applied science for teachers, and home economics. The teachers' department is developing a strong course for those who plan to go into the field of industrial school instruction. Short courses of two years each, in agriculture, engineering, and domestic science are given. There is a sub-freshman course of two years, but students are encouraged to get their preliminary training in the ordinary high schools. A winter course of twelve weeks in the poultry industry has been conducted regularly for a dozen years. The usual United States Experiment Station is in affiliation with the College. L. + B., \$300; M., \$52,000; S., 153 (agriculture, 23; English, 74; science, 21; preparatory, 16; short course in poultry industry, 19). Annual cost of instruction per pupil, \$350—does not take investment into account. (2) The Rhode Island State Normal School, at Providence, furnishes instruction in manual training and domestic science to prospective teachers. (3) Industrial training of some kind is given in each of the State reform schools, and institutions for defectives.

Private Foundations.—(1) The Rhode Island School of Design, at Providence. Established in 1877, as the result of the influence of the Philadelphia Centennial. Largely sustained by memberships in the Association of the Rhode Island School of Design. Also by subscription, and by the fees for instruction. The State gives a small annual appropriation, and scholarships

are maintained both by the State, and by the city of Providence. The departments of textile design, and decorative design are much frequented. The institution has been of great value to the jewelry industry of Providence. To a large extent an industrial art school—an industrial improvement section flourishes, and a department of fine arts has a full quota of students. The School of Design co-operates with Brown University in the giving of certain courses. There are both day and evening sessions. Children's classes meet on Saturdays. S., 794 (445 children). (2) Brown University, at Providence, offers civil, electrical, and mechanical engineering, mechanics, mechanical and architectural drawing. S. in University, 995.

SOUTH CAROLINA.

Agriculture in the Public Schools.—The elements of agriculture must be taught "as far as practicable" in all the public schools of the State. However, in the year 1907, out of a total enrollment of 314,399 pupils in the public schools, the number of those studying agriculture was only 2,614 (1,184 white; 1,430 colored).

Manual Training.—High schools receiving State aid are required to include manual training in the course of study. Schools having at least \$300 worth of equipment may receive \$100 additional.

State Schools.—(1) The University of South Carolina, at Columbia, will develop courses in engineering. M., \$72,956; S., 280. (2) The Clemson Agricultural College, at Clemson College, receives the Federal grants. The Clemson bequest consisted of the former home of John C. Calhoun, and other property to the value of \$59,000. Four-year courses are offered in agriculture, and animal industry, chemistry and geology, mechanical and electrical engineering, civil engineering, and the textile industry, besides special courses (including cotton grading) and a preparatory department. Ent. req.: about equal to eight grade graduation. The College derives its income chiefly from the Federal grants and the State fertilizer tax. As in several other States, the railroad company has furnished coaches and free

transportation, on occasion, for the exhibition of farm products and appliances, and for institute work among the farmers. L. + B., \$600,671; E., \$250,000; M., \$225,000; S., 701. Tuition, \$40, and incidental fees. (3) Winthrop Normal and Industrial College, at Rock Hill, is the State college for white girls and women. In the industrial department, industrial drawing, designing, dressmaking, sewing, millinery, cooking; house-keeping, horticulture, floriculture and dairying are taught besides business courses. Very few students go in for more than a smattering of the industrial work. L. + B. + E. = \$365,000; M., \$81,116.85; S., in Normal department, 490; in literary, 9; special students (including industrial), 32. (4) The Colored Normal, Industrial, Agricultural and Mechanical College, at Orangeburg, shares in the Federal appropriations. Industries and trades in great variety are taught here. The school is co-educational. S., 683.

Private Foundations for Colored.—Claflin University, at Orangeburg; Lancaster Normal Institute, at Lancaster; Brewer Normal School, at Greenwood; Sterling Industrial College, at Greenville; Penn Normal, Industrial and Agricultural School, at Frogmore; Benedict College, and Allen University, at Columbia; Avery Normal Institute, at Charleston; and Schofield Normal and Industrial Institute, at Aiken, are schools for colored, in which varieties of industrial subjects are taught.

SOUTH DAKOTA.

Manual Training.—A few of the larger high schools—at Sioux Falls, Canton and Lead—have introduced manual training. It is also found in the schools of Deadwood and Mitchell.

State Schools.—(1) The University of South Dakota, at Vermillion, affords instruction in mechanical, civil, electrical and chemical engineering. The university is maintained almost entirely by the State appropriations, but will eventually have the income from 86,000 acres of land, granted by the Federal Government, and which cannot be sold for less than \$10 per acre. S., 424. (2) South Dakota College of Agriculture and the Mechanic Arts, Brookings, is developing rapidly along both lines

indicated by its title. It was granted 160,000 acres by the Federal Government, and has sold less than 4,000 acres. S., 570 (of these, 180 in preparatory department, and 165 in short courses). (3) The South Dakota State School of Mines, at Rapid City, was endowed with 40,000 acres of land. A four years' course. Entrance from accredited high schools. M., \$37,000. S., 93, of whom 45 are in preparatory course. (4) The Northern Normal and Industrial School (State), at Aberdeen, gives extended courses in manual training and household economics. The State Normals at Madison, Spearfish and Springfield, furnish similar, although more restricted courses. (5) The State School for the Blind (Gary), and (6) the South Dakota Training School (reform school at Plankinton) afford manual instruction.

Industrial Schools for Indian Children are found at Chamberlain, Flandreau (Riggs Institute), Lowes, Brule, Oahe, Pierre, Pine Ridge (Oglala School), Springfield, Rapid City and Rosebud.

TENNESSEE.

Manual Training.—Taught in the schools of the principal cities and towns only.

Agriculture in Public Schools.—"In every secondary school (including county H. S.) shall be taught * * * * the elementary principles of agriculture." (School Laws.) "The Superintendent of Public Instruction of the State, and the Commissioner of Agriculture, shall be constituted a commission to procure the preparation of, or the designation of, a work on the 'Elementary Principles of Agriculture,' which shall be taught in the public schools" (School Laws). In the year 1907, the number of pupils studying agriculture in the public schools of the State was reported as 12,158 (5,653 in 1906); in writing, the most commonly pursued subject, 395,922. In city schools 547 pupils were studying agriculture.

State Schools.—(1) The University of Tennessee (Knoxville), receives the Federal grants under the Morrill and subsequent acts, and bulletins the full list of engineering and agricultural courses. The variety of short courses—in agriculture,

animal husbandry, dairying, poultry husbandry, bee husbandry, horticulture and domestic science—is to be noted. An “industrial department for colored students” (in Knoxville College) furnishes instruction in agriculture, printing, carpentry, sewing, cooking, electricity, bricklaying, brickmaking, baking, mechanics, blacksmithing and wheelwrighting. S. in University, 760. (2) There is no State normal school in Tennessee, but the Legislature provides scholarships in Peabody Normal College, at Nashville, where manual training and domestic science are features of the curriculum.

Private Foundations.—(1) Vanderbilt University, at Nashville, presents civil, mechanical, mining, electrical, agricultural and chemical engineering courses. S. in university, 902; in engineering, 83. (2) The University of the South, at Sewanee, offers civil engineering. (3) Cumberland University, at Lebanon, presents civil engineering and architectural courses. (4) Southwestern Baptist University, at Jackson, gives civil engineering instruction.

Private Foundations for Colored.—(1) Fisk University, at Nashville, offers work in agriculture, the mechanic arts, manual training, domestic economy, and domestic art. The academic tendencies have predominated. S., 571. (2) Knoxville College, Knoxville, maintains an industrial department, which is counted a department of the University of Tennessee, by contract with the latter, and receives, through the University of Tennessee, a portion of the Federal aid accorded for instruction in agriculture and the mechanic arts. It meets the requirements of the statutes of the State, which direct that “no citizen of this State otherwise qualified shall be excluded from the privileges of the university by reason of his race or color, but the accommodations of persons of color shall be separate from the white.” Subjects taught here are noted above (under U. of T.). (3) Walden University, at Nashville; Morristown Normal and Industrial College (a dozen trades or industries taught here), Morristown; and Le Moyne Normal Institute, Memphis, are other schools for colored students, giving forms of manual instruction.

Reform Schools.—Hamilton County Industrial School and Farm, at East Chattanooga; and Tennessee Industrial School, at Nashville, maintain industrial courses.

TEXAS.

Manual Training.—It is the duty of the State Board of Education to duplicate any amount not less than \$100 nor more than \$500 appropriated by local boards of trustees for manual training. Such appropriation to be made but once to any district, and only to one district in a county. State Superintendent must decide where more than one application from a county (from Act of 1903). Under this provision, the State appropriated \$10,000. Of this amount \$8,000 was paid to 16 cities. The succeeding Legislature (of 1904) provided for the continuation of this work, but made no appropriation for the purpose, nor has any further action been taken up to this time. Manual training is developed in the schools of about thirty Texas cities and towns. The annual appropriations for the purpose from all sources is about one-twentieth of the amount expended in New Jersey. (1) Allan Manual Training School, Austin.—An estate valued at about \$35,000 (now \$50,000), was bequeathed about twenty years ago by Mr. John T. Allan for the purpose of founding a school “wherein shall be taught the practical use of tools as well as scientific principles.” In 1896 the Allan School was organized as a department of the high school. Six hours and forty minutes are devoted weekly to the manual training work. Entrance, graduation from ward (grammar) schools. Course, four years of nine months each. Tuition free to residents. Shop practice taught to electrical engineering students of State University (tuition \$25). Also used as observation school for university students of education, and the principal gives a course in the pedagogy of manual training at the University. S. in domestic science and arts, 200; in manual training, 150. New Building to be erected soon.

Industrial Education.—No state provision except as noted below.

State Schools.—The University of Texas, at Austin, has a department of engineering, giving courses in civil, electrical and mechanical engineering. (2) The Agricultural and Mechanical College of Texas, at College Station, offers mechanical, civil,

textile, electrical and architectural engineering, besides regular and short courses in agriculture and kindred subjects. Of the undergraduates in 1908 four were enrolled in the engineering courses for every one that was found in the agricultural course. The 180,000 acres of land obtained under the Federal grant of 1862 were sold for \$174,000. The college appropriates \$6,000 annually for the payment of student labor. F., 46; S., 630. (3) The College of Industrial Arts, at Denton, is designed for the training of women. Established 1901. Growing rapidly. Courses: English-Science, Domestic Arts, Fine and Industrial Arts and Commercial Arts, all requiring two years of study for graduates of schools accredited by the University of Texas or holders of first grade teaching certificates. White girls over 16 years of age, "who have a fair knowledge of the common school subjects," are admitted to the two-years preparatory course. "Members of the senior class must make their own graduating dresses." Drawing, painting, basketry, sewing, dressmaking, millinery, cooking, dairying, laundering, manual training (in wood), horticulture, photography, bee culture, floriculture and poultry keeping are among the subjects taught in the institution. Tuition free. Board (including room and laundry), \$15 per month. State appropriation, \$34,000 annually. Between 35 per cent. and 40 per cent. of the graduates have gone into the teaching profession. L. + B., \$165,000; E., \$40,000; M., \$38,000. Cost of instruction, around \$200 annually per pupil (summer school students excluded). S., 296 (including 97 in summer school). (4) Prairie View State Normal and Industrial College (for colored) is a co-educational school in which agriculture, dairy husbandry, horticulture, carpentry, iron working, wheelwrighting, painting, shoemaking, tailoring, sewing, millinery, cooking and laundrying are among the industries and trades taught. Over fifty per cent. of the enrollment of 485 is in the preparatory (or grammar) department. Annually the institution receives a part of the federal grant.

Private School.—Grubbs' Self-Help and Industrial College, Greenville, furnishes instruction in agriculture, horticulture and domestic science. For colored: Samuel Huston College (Austin), Tillotson College (Austin), Bishop College (Marshall), Paul

Quinn College (Waco), Guadalupe College (Seguin) and Wiley University (Marshall) furnish manual instruction.

UTAH.

Manual Training and Industrial Education.—No provision of note in State laws. Manual training is hardly found outside of the schools of the largest cities and towns. The State University issues a "high school circular" and course of study which includes manual training and mechanical drawing.

State Schools.—(1) The University of Utah (Salt Lake City) comprises four schools: The School of Arts and Sciences, the State Normal School, the State School of Mines and the School of Medicine; a preparatory school is connected with the institution. The School of Mines is not restricted to mining engineering alone, but offers six undergraduate degree courses, each requiring four years for completion: mining, electrical, civil, mechanical, chemical and general engineering. In addition, there is a course in irrigation engineering given jointly by the Agricultural College of Utah and the State School of Mines. The State Normal School furnishes instruction in manual training and domestic science for teachers. A branch of the State Normal is located at Cedar City. Manual training, domestic science, cooking, sewing and dressmaking are found in the curriculum of the University Preparatory School. S. in university: Arts, 250; mines, 190; normal, 177; preparatory, 191; summer school, 269. (2) The Agricultural College, at Logan City, comprises the schools of agriculture, domestic science and arts, commerce, mechanics arts and general science. Ordinary courses are three or four years in length and are designed to lead to practical occupations in industries or trades. Extension courses of one week's duration are given in various rural communities. Winter courses are offered in agriculture, domestic science and arts, trades (carpentry, forging, cabinet-making, horseshoeing and carriage repairing), commerce and forestry. S., 882; annual cost of instruction per pupil, not over \$175. (3) The State Reform School ("industrial school"), and the School for Defectives afford manual and industrial training.

Private Foundations.—Brigham Young University, at Provo, has a "school of arts and trades" and a "school of agriculture." Brigham Young College, at Logan, includes civil engineering and domestic science in its courses. The Latter Day Saints' University, at Salt Lake City, does something in the way of domestic science instruction.

VERMONT.

Manual Training and Industrial Education.—No State provision. Manual training instruction is given in the schools at Rutland, Burlington, Brattleboro, Bellows Falls, Barre, Montpelier, St. Albans and St. Johnsbury. Very little is done in this direction in the small village or rural schools. A strong movement is on foot to introduce manual training and agriculture in the public schools generally, and to extend the State normal provision in this other respects. Industrial education in elementary or secondary schools is not found within the borders of the State, except at the State reform school, known as the Vermont Industrial School (Vergennes). In this school all of the shoes worn by the boys and girls are made and repaired, while all their clothing is made by the young people in the tailoring and dressmaking departments. The printer's trade, cooking, photography, pyrography, basketry, butter-making, milk testing and general dairy and farm work are also taught.

State Schools.—The University of Vermont and State Agricultural College, at Burlington, receives the federal grants for agriculture and the mechanics arts. The usual engineering branches are offered, and short courses in agriculture and dairying are featured. In making scholarship appointments to this institution preference is given to candidates for the agricultural and industrial departments. Total S., 541.

Private Foundation.—Norwich University, at Northfield, has courses in civil and chemical engineering.

Manual Training, and Industrial Education.—No general provision making establishment mandatory. By Act of 1908 a sum of money from the State treasury, "not to exceed twenty thousand dollars, shall be devoted to the establishment of departments of agriculture, domestic economy and manual training in

at least one high school in each congressional district of the State." Such departments are in operation at Appomattox, Appomattox county; Burkeville, Nottoway county; and Manassas, Prince William county, and arrangements have been made to establish others in Chester, Hampton, Middletown, Elk Creek, Courtland and Lebanon. There is no State requirement concerning the teaching of agriculture or manual training in the public schools. Counties, cities, towns and districts may make appropriations to non-sectarian schools of manual, industrial, or technical training, or to any school or institution of learning owned or exclusively controlled by such counties, cities, towns, or school districts. School boards may introduce manual training in any public school. There are still several important city systems of public schools in the State where very little or nothing has been done in this direction.

State Schools.—(1) The University of Virginia, at Charlottesville, has a department of engineering. The University has not been open to women. S. in University, 790. (2) The Virginia Agricultural and Mechanical College and Polytechnic Institute, at Blacksburg, offers civil, mechanical, mining, and electrical engineering; besides agriculture, horticulture, applied chemistry, preparatory veterinary science, metallurgy and metallography, general science, and applied geology. The regular courses are of four years' duration, and lead to the degree of bachelor of science. The entrance requirements in mathematics include a knowledge of algebra through quadratics, and of two books of plane geometry. A School of Agricultural Apprentices has been organized to give to boys of at least sixteen years of age, in a two years' course, "the elements of a general education, a knowledge of the principles and art of agriculture, with such training in the mechanic arts and business methods as will fit them for success on the farm." Applicants for this course must have a good working knowledge of English, and in mathematics must have finished arithmetic. Short courses are given in the winter in agriculture, animal husbandry, horticulture and dairying. L.+B., \$537,800; E., \$100,000; M., \$109,464; S., 567 (383 in engineering). Tuition for non-residents \$50 annually. Yearly cost of instruction \$141. (3) The Virginia Military Institute,

at Lexington, has a long and honorable record. It gives instruction in engineering subjects, in addition to academic and military branches. Admission on completion of high school course, or thereabouts. There are "pay cadets" and "State cadets." The latter, having scholarships, agree to teach at least two years in the public schools of the State. S., 340. (4) The College of William and Mary, at Williamsburg, furnishes instruction in subjects required by teachers in the public schools. (5) The State Female Normal School, at Farmville, has courses in manual training and domestic science. (6) In the Virginia Normal and Industrial Institute, at Petersburg (for colored), instruction is given in cooking, sewing, dressmaking, manual training and the elements of agriculture.

Semi-Public Schools.—(1) Virginia Mechanics Institute, at Richmond. This is an evening industrial improvement school (with a commercial improvement department), supported by the city of Richmond, which first voted money for the night school in 1885. Since 1905 the city has made an annual appropriation of \$10,000 for the upkeep of the institution. Tuition nominal (\$3 for first class, and \$1 for each class additional). S., 548. Percentage of attendance throughout the session, 84%. Attendance has nearly doubled in three years. L.+B., \$44,000; E., \$13,800. Annual cost of instruction per pupil something over \$20. (2) The Miller Manual Labor School, at Miller School, affords manual and trades instruction to both sexes. L.+B., \$40,000; E., \$24,000; M., \$21,000; S., 274.

Hampton Normal and Agricultural Institute.—This institution, located at Hampton, was founded in 1868 by General S. C. Armstrong, for the practical training of negro youth. At the outset there were fifteen pupils, two teachers, and a school building made from hospital wards. It now has 850 boarding pupils (768 negroes, 82 Indians), and 511 colored children in the Whittier Training School (in affiliation with the normal department). Since 1868 students to the number of 8,181 have received instruction. Of these, 2,362 are in educational work—among them Dr. Booker T. Washington—and have taught over 250,000 children in 18 States; 2,092 are tradesmen and farmers; 1,618 are

home keepers; 905 are laborers and servants; 498 are in business and clerical work; 431 are in the professions; 275 are studying in other institutions. The influence of the school has led to the establishment of 30 industrial schools, land companies, and social settlements, influencing over 16,000 people. Academic and pedagogical branches are taught, also agriculture (there is a farm of 700 acres in operation, besides a model farm, poultry yards, dairy, orchards, and experiment garden), domestic science, and trades—in the Armstrong-Slater Memorial Trade School—as follows: carpentry (S., 66), cabinet-making, bricklaying (S., 56), plastering, wheelwrighting (S., 8), blacksmithing (S., 43), machine work, steamfitting and plumbing, tailoring (S., 30), shoe-making, tinsmithing, upholstering (S., 1), and printing. Hampton is not a Government or a State school, but receives federal aid—both from the agricultural funds and for the training of Indians (\$167 per head). It also receives support from educational boards and from donations. Unlike Tuskegee, Hampton employs many white teachers. Endowment, \$1,500,000.

Other Foundations.—Other schools giving some manual or industrial training are: St. Andrews School (for white), at Richmond; Bowling Green Industrial Academy, Bowling Green; and for colored, the John A. Dix Industrial School, Dinwiddie; the Wm. McKinley Normal and Industrial School, Alexandria; Thyne Institute, Chase City; the Temperance, Industrial and Collegiate Institute, Claremont; Manassas Industrial School, Manassas; Norfolk Mission College, Norfolk; Virginia Normal and Industrial School, Petersburg; Union Industrial Academy, Port Conway; Hartshorn Memorial College and Virginia Union University, Richmond, and Suffolk Normal and Industrial School, Suffolk.

WASHINGTON.

Manual Training and Industrial Education.—Must be taught in each State normal school. In cities of ten thousand or more inhabitants, the school board of directors may establish and maintain such grades and departments (including normal training, industrial schools and departments for the training of de-

fectives as shall, in the judgment of the board, best promote the interests of education in the district. The principal cities and towns have introduced manual training, but industrial education has not made headway. There are no industrial schools in the State.

State Schools.—The University of Washington, at Seattle, includes in its College of Engineering courses in civil, electrical, mechanical and chemical engineering. There is also a School of Mines and a School of Forestry in connection with the University. The U. S. Forest Service co-operates with the School of Forestry in presenting a twelve weeks course for forest rangers and guards, as well as “for cruisers, logging superintendents, woodland owners and others who wish to acquire a knowledge of the general principles of forestry and methods by which timberlands are handled to insure continuous crops.” University L.+B., \$1,535,000; E., \$289,745; M., \$202,000; F., 103; S., 1,703; tuition, free, except in summer school; annual cost of instruction per pupil, \$132. (2) The State College, at Pullman, receives the federal grants. Almost a university in scope, but professions of law (except mining), medicine (except veterinary) and theology are not provided for. Has department of education. Business courses are given. Short courses in agriculture, assaying, science for teachers, dairying and the trades are included in the offerings. The college has 190,000 acres of land, received under various grants. F., 97; S., 1,450. (3) The State Reform School, at Chehalis, furnishes industrial training for both sexes (cp., also the Seattle Parental School, at East Seattle).

WEST VIRGINIA.

Manual Training and Industrial Education.—Agriculture must be taught in all the free schools. County high schools are being established and offer manual training, as do also the State normal schools and the public schools of the principal cities and towns. There are no purely industrial schools in the State.

State Schools.—(1) The West Virginia University, at Morgantown, divides with the West Virginia Colored Institute the

federal appropriation for agriculture and mechanics. Offers four-year courses in engineering and agriculture and short courses in agriculture, animal industry, horticulture, poultry industry, dairying, manual training and the mechanic arts. S., 1,208. (2) The preparatory branches of the West Virginia University, at Keyser and at Montgomery, are secondary schools with work in manual training. (3) The West Virginia Colored Institute, at Institute, receives \$5,000 annually from the federal appropriation. It includes in its offerings agriculture, carpentry, machinery woodworking, blacksmithing, brick masonry and plastering, wheelwrighting, painting and frescoing, sewing, dressmaking, millinery, cooking and printing. (4) Storer College (colored), at Harper's Ferry, is not a State institution, but receives State aid for the training of teachers. Manual training and domestic science are included in the curriculum.

WISCONSIN.

Manual Training and Industrial Education.—(a) High schools with approved manual training departments receive State aid, as follows: (1) One-half the amount actually expended for instruction during the year, but not to exceed \$250 annually, from the State to each high school; (2) when manual training has also been maintained in the three upper grades next below the high school, and the work connected therewith is approved by the State Superintendent of Public Instruction, the State aid may be extended to total not more than \$350 annually to each high school. In 1907 the Legislature increased the maximum total that might be expended from the State treasury for the above purpose from \$5,000 per annum to \$25,000. Manual training has been quite generally introduced into the public schools of the important municipalities. (b) "The elements of agriculture shall be taught in every district school" (School Laws). (c) The Trade School Act of 1907 was passed to permit the Milwaukee Board of Education to take over a private trade school, and the law has not been acted upon favorably in other cities. (d) "County schools of agriculture and domestic economy" receive State aid (cp. the introduction to this chapter and

a paragraph farther down) to the amount of \$4,000 annually to each school. The number to receive State support is limited at present to eight. (e) County normal schools are provided for by the laws of Wisconsin. They receive State aid—two-thirds of the amount actually expended for maintenance during the year, but not to exceed \$3,500 annually to any one school. Recently the number of county normal schools which might be placed by the State Superintendent of Public Instruction on the approved list to receive State aid was raised from 12 to 20. Manual training and domestic science are subjects found in the curricula of the county normals.

State Schools.—(1) The University of Wisconsin, at Madison, receives the federal grants in aid of agriculture and the mechanic arts. Included among its faculties are the College of Agriculture and the College of Engineering. In the College of Engineering instruction is given in civil, sanitary, mechanical, electrical, mining and general engineering and in applied electrochemistry; in the College of Agriculture four-year and two-year courses are given in agriculture, and, in addition, a short course in agriculture, a winter dairy course, a summer dairy course, farmers' institutes (two weeks in duration), extension lectures and correspondence courses. Other technical subjects are also taught by means of correspondence schools. Home economics and kindred subjects are taught in the colleges connected with the University. S., 4,500. (2) Sub-vocational and allied branches required by teachers in the public schools are taught in the State normal schools at Milwaukee, Oshkosh, Platteville, River Falls, Stevens Point, Superior and Whitewater. (3) Recent legislation provides for the establishment at Platteville, of an institution to be called the Wisconsin Mining Trade School. The course of instruction is two years in length. The appropriation was \$30,000. (4) Various forms of manual and industrial training are found in the State schools for defectives and for reformation.

The Milwaukee School of Trades.—This school, opened under private auspices in January, 1906, was taken over by the Milwaukee Board of Education on July 1st, 1907. Instruction is given in day classes in four trades. Patternmaking, the machinist

trade and woodworking demand two years of 52 weeks per year, and one year is necessary to complete the course in plumbing. The total number of hours to be spent in the school is 4,464 for each of the first three trades; and 2,232 hours in the plumbing trade. There are also night classes from October 1st to April 30th. In each trade instruction is given in the following branches: (a) shop practice and trade lectures, (b) drawing, (c) work shop mathematics, (d) shop inspection trips (including written reports), (e) practical talks and lectures on subjects connected with each trade and topics fundamental to all trades. In both day and evening classes tuition is free for residents between the ages of 16 and 20. The preference is given to graduates of the eighth grade, or to students of similar preparation. The institution is supported by a one-half mill tax on the assessable property in Milwaukee. There is no State support. E., \$45,000; S. in patternmaking: day, 20; night, 15; in the machinist's trade: day, 25; night, 38; in woodworking: day, 10; night, 14; in plumbing: day, 12; night, 22; total, 156. The cost of instruction is about \$225 per year for each pupil, exclusive of interest on investment and depreciation of equipment, etc.

The Marathon County School of Agriculture and Domestic Economy.—It was the first school of the kind to be established. The conditions under which this institution was established have been given already. It receives \$4,000 annually from the State, and \$2,000 from the county, for maintenance. The following is the course of study, extending over a period of two years: Agronomy—(a) Soils—The origin, formation, and types of soils. The temperature and moisture conditions of various soils and what may be done to control them. Reasons for the various tillage operations, and when and how to perform them. The fertility of the soil, its source its use, its loss, its conservation, and its restoration. Manures and fertilizers—their composition and use. (b) Crops—The various farm crops with their uses, culture, and adaptation to conditions of soil and climate. The production, selection, preservation, and testing of seeds. Crop rotations—why necessary, study of model rotations and practice in making rotations to suit given conditions. The harvesting, preservation, and disposition of crops. (Many varieties of farm

crops are grown at the school that students may become familiar with them.) Horticulture—(a) General—Methods of plant propagation from seeds, bulbs, tubers, roots, runners, layers, cuttings and grafting. Methods of pruning trees and shrubs. Plant enemies and their control, with special attention given to methods of spraying insects and fungi. General principles of plant breeding. (b) Orcharding—Selection of orchard sites and laying out of orchards. Choice of varieties. Transplanting and setting trees. Management of orchards. Picking, storing, and marketing fruits. (c) Gardening—Where, when, and how to make a small fruit or vegetable garden. Choice of varieties and methods of culture. (A students' school garden has been laid out this year for demonstration purposes.) Students draw up planting plans and assisting in planting the early garden. (d) Landscape Gardening—The fundamental principles of landscape gardening and their application in planning the planting of home and school grounds. The drawing of several plans. The flower garden. (e) Forestry—The general principles of good forestry management. Relation of forests to climate and rivers. Animal Husbandry—(a) Stock raising—The origin, characteristics and uses of the more common breeds of neat cattle, swine, sheep and horses. Practice in scoring and judging representative animals of different breeds. The principles of feeding, with practice in the calculation of economical rations for different classes of animals. The general principles of stock breeding. The general care of animals and treatment of the more common diseases. (b) Dairying—The general management of the modern sanitary farm dairy. The Babcock test and the cream separator. Creamery butter and cheddar cheese. (c) Poultry raising—Breeds of poultry, their characteristics and uses. Housing and management. Natural and artificial incubation and brooding. Methods of feeding. Preservation of eggs. Bench and forge work—(a) Bench work—The use and care of wood-working tools. Sawing, planing, squaring, chiseling, etc. Various joints and their application, mortise and tenon and dove-tail joints, etc. Making of whiffletree, evener, neckyoke, tool handles, wagon box and seat, bee hive, incubator, brooder, door and window frames, screens, pieces of furniture, etc. Construction of models of house, barn,

and other farm buildings. (b) Forge work—The use and care of iron working tools. Repair work on the farm. Making of bridle iron, gate hooks, clevis, bolts, tongs, links, chisels, hammers, punches, wrenches, butcher knife, etc. Riveting, filing, and soldering. Mechanical drawing—The elements of mechanical drawing to give skill in making pattern for work in wood and iron, and to facilitate the drawing of plans of houses, barns, and other buildings. Tracings and blue prints of plans. Rural engineering—Plans, specifications, and estimates of materials, and cost of farm buildings of all kinds. Water supply and sanitation. Heating and ventilation. Silos and root cellars. Fences, gates, and bridges. Road building. Concrete work. Care and management of farm machinery. Leveling and drainage. Domestic economy—(a) Cookery—The theory and practice of the preparation of food. Composition, use, and nutritive value of foods. Kitchen management, dish washing, care of utensils, control of range. Making of bread, cake, pastry, soups, salads, desserts, puddings, ices, etc. Pickling, canning, preserving, jelly making. Planning, cooking and serving meals. Foods and dietaries. Cooking for invalids and children. Selection of foods. Marketing. Care of dining room. Carving and serving. Use of chafing dish. (b) Chemistry of foods—Classification and composition of foods. (c) Domestic hygiene—Need of pure air, and how to obtain the same. Function of clothing and its relation to health. Drainage, plumbing, heating, lighting, and ventilation of dwellings. Cause of disease. Infectious diseases. General laws of health. Digestion and assimilation of food. (d) Laundering—General principles of laundering. Composition, action, and use of water, soap, soda, bluing, borax, and washing powders. Removing stains and disinfecting. Washing flannels and woollens, white goods and prints. Starching and ironing. (e) Sewing—Elements of sewing, including different stitches, seams, hems, darning, etc. Use of care of the sewing machine. Cutting, fitting and making plain garments and dresses. Pattern making with tape and square. (f) Millinery—Discussion of taste in selection of bonnets, hats, frames, plumes, flowers, and trimmings. Trimming hats and bonnets. Harmonizing of colors. (g) Home economy—Relation of income to expendi-

tures. Proportion of expenditure for existence, comfort, culture, and charity. A study of the farm income. Purchase of clothing, household stores and furnishings. Keeping of accounts. Home management in relation to care of house and its equipment, house cleaning and sanitation, cleaning and pressing of clothing, storing furs for the summer, care of carpets, rugs, foods, and provisions. Social usages in relation to manners, behavior, voice, conversation, introductions, invitations, etc. In addition to the foregoing, instruction is also given in English, history and civics, arithmetic and vocal music. Some of the things this school is doing for farmers, free of charge, are announced, in a bulletin, to be as follows: testing milk, cream and skim milk; selecting cattle for purchase; giving consultation upon plans and specifications for all farm buildings; supplying information regarding special crops; testing seeds for germination and purity; furnishing seeds and cuttings of flowers and plants; giving instruction in pruning fruit orchards and trimming shade trees; supplying bulletins from State and United State departments to those applying; furnishing information regarding harmful insects and methods of destroying them; laying out of orchards; planning drainage systems; treating cows for milk fever. L. + B., \$25,000. E., \$6,000. Annual cost of instruction per pupil is something over \$100. S. in agriculture, 29; in domestic science, 34. (For a list of similar schools see introduction.)

ganized to carry on the work of the Stout Training Schools.

Stout Institute.—Stout Institute, at Menomonie, has been organized to carry on the work of the Stout Training Schools. These schools are four in number, and are known as: (1) The School for Manual Training Teachers (S., 41); the School for Domestic Art and Science Teachers (S., 121); and the School for Homemakers (established last year—S., 14); and the School for Kindergarten Teachers (S. 37). For admission to any of the training courses, graduation from a high school or equivalent preparation is necessary. The courses require two years' work for their completion. Three years of advanced work is also offered. Summer sessions are held for the instruction of teachers of manual training and domestic science and art. The third summer session in 1908 enrolled 93 students, representing 20

States and Canada. In connection with the schools, a trade school for instruction in plumbing and bricklaying was organized in September, 1908. The schools are housed in magnificent buildings, the gift of Hon. J. H. Stout.

Indian Schools.—Indian schools in which industrial training is given are found at Hayward, Lac du Flambeau, Oneida, Tomah and Wittenberg.

WYOMING.

Manual Training, and Industrial Education.—Laws merely permissive. There are no industrial schools in the State.

State Schools.—The University of Wyoming, at Laramie, comprises among its departments the College of Agriculture and Mechanic Arts and the Normal School and Teachers' College. The Federal aid received by the agricultural department (\$78,000.63 in 1907-1908) is much greater than the State appropriations (\$45,460.02 in 1907-1908) for the entire University—at times the ratio is 4 to 1. L. + B., \$300,000; E., \$185,000; M., about \$100,000; S., 223. Admission requirements: 14½ Carnegie units.

Appendix E.

Same Observations on the Individual Training of Europe.

There is space here for only a few notes concerning the industrial schools of Europe, derived chiefly from the personal investigations conducted by the Secretary. For more detailed description of what is being done on the Continent and in Great Britain for the advancement of industrial instruction, the abundant literature now available on this topic may be consulted—*c. g.*, the excellent reports issued by the U. S. Department of Commerce and Labor (*esp.* "Trade and Technical Education," 1902; and "Industrial Education and Industrial Conditions in Germany," 1905); "The Industrial Improvement Schools of Wuerttemberg" (also contains a summary of conditions in other European States), MacMillan and Company, New York, 1907; the U. S. Consular Reports; the standard works of von Klimburg, Ware, Sadler, Kerschensteiner, and others; and the individual reports issued by State departments (*esp.* Commerce and Industry, or Agriculture) abroad.

Germany has done more than any other country to meet the modern demand for industrial training—not the education of the technical engineer alone, but the vocational betterment of all classes of workers, including those who have to do with the important cares of the household. Naturally enough, Germany has a number of most excellent higher engineering colleges—called "technical high schools." These institutions are on a par with the better class of engineering college, college of agriculture, or institute of technology found in America. The "technical high school" at Charlottenburg is perhaps the best equipped institution of its kind in existence. However, it has not been by means of such institutions alone that Germany has secured supremacy in the industrial field. The graduates of engineering colleges in

America, for instance, are more numerous, and so far as can be judged they are equally well trained. The work of American engineers—from the plains of Siberia to the Cape of Good Hope—has won the everlasting respect of the experts of all nations. It was admiration of these achievements that lead an English philanthropist to send large numbers of teachers to America, to study the educational system which could produce efficiency of such high type. But the English commissions found us lacking in facilities for the training of the average workman—even more lacking than England. This hiatus in the educational provision is by no means duplicated in Germany. The Germans furnish not only manual training—in grades equivalent to those of our elementary schools (and they provide it more universally, and with better organization and sequence of subject matter than is found in many American schools), but also they furnish, in separate schools, *industrial education*, intended for the great majority of individuals who leave school early in life (in Germany, usually at the age of fourteen) to go to work. The Germans are perfectly clear, on the whole, as to the meaning of “industrial education.” The Government does not attempt to give vocational training to boys and girls under the age of fourteen. Nevertheless, the value of sub-vocational exercises in paper-folding, basketry, work in wood and iron (for boys), and in sewing and cooking (for girls), in the elementary school, is fully recognized.

The masses of individuals in Germany who leave school at about the age of fourteen to go to work are required by law to attend industrial improvement schools, or commercial improvement schools—according as they are engaged in industry or commerce—for two or three years longer (evenings, or a few hours in the daytime on selected days), while they are between the ages of fourteen and eighteen. This provision is the State law of several of the German States, and throughout the Empire a similar requirement has been made effective by vote of the majority of the municipalities. The present tendency is toward a compulsory *imperial* law for attendance upon industrial improvement schools.

The industrial improvement schools provide vocational training to students grouped by trades. Although they are designed

chiefly for apprentices, they are also much frequented by older workers, who realize the advantage of keeping in touch with the best that there is in vocational instruction. In the majority of the industries the training is centered around instruction in drawing. The drawing that is taught is organized, as a subject, to suit the particular trade for which preparation is desired. There is drawing for cabinetmakers, for locksmiths, for carpenters, masons, machinists, jewellers, potters and for every other trade in which the knowledge would be of any advantage. Workers in such trades as baking and barbering are generally excused from some of the drawing classes, although it may be said that many such individuals elect to continue in some technical drawing class in order to be fortified for the struggle of life in the event of a change in occupation. The opportunity is afforded to all to continue in advanced courses after the required subjects of the apprenticeship years have been completed. Many a German workman has been known to attend the industrial improvement schools for a period of twelve to twenty years, and even longer.

Other subjects of vital importance in any industrial improvement school are industrial mathematics and industrial German. The industrial mathematics include whatever arithmetic, algebra, or practical geometry or trigonometry are required for the particular occupation. Vocational text-books are issued for each trade, giving the special problems and exercises needed. The same is done for the teaching of what is known as "industrial German." The latter is simply a reading book which gives popular information concerning a trade, and some of the best excerpts from literature, in regard to the workshop, factory, farm or household, the dignity of labor, the relation of the working individual to his employer, servant, the union, the community and to the State.

In addition to the subjects mentioned above, courses are added as demanded for particular vocations—industrial chemistry and other special topics. On account of the universality of the building and machine trades, these are generally the occupations for which classes are first organized. The industrial improvement schools sometimes have a commercial improvement division

where the various commercial branches are taught, for in Germany the private business college is not so developed as with us. Quite often the commercial improvement schools are organized as entirely separate institutions. There are also agricultural improvement schools, distinct in organization from other types.

The "general improvement school" ("continuation"), which affords instruction in the "four R's"—reading, writing, arithmetic and religion—is commonly confused with the industrial improvement school in current discussions. Although up to the present time the former type of institution has been more often under the compulsory State law than the latter, the general improvement school has no special bearing upon the industries or vocational training of any kind. Its mission is to bring the young people back under the influence of the church for a short period each week and to catch the few illiterates who have altogether escaped the elementary schools—perhaps through living in one of the distant colonies in early life—and to give them enough instruction to enable them to count as literate. The "Sunday-school" of Germany is usually a "Sunday improvement school," with instruction in academic branches as well as in religion. Vocational Sunday-schools also exist, especially for instruction in industrial drawing and industrial mathematics, but the Sunday-school of this character has generally been replaced by evening industrial improvement schools, which afford more time for the instruction, and the evening industrial improvement schools are now giving way to partial time day industrial improvement schools—compulsory by State law.

From the industrial improvement schools up to the engineering colleges—the "technical high schools," sometimes called "technical universities"—there are vocational schools of every degree—industrial "short courses," which are principally in the nature of reviews or special lectures for foremen or master workmen; low grade trade schools, for everything from straw-plaiting up (these schools thrive in Saxony where they are numerous, although the classes are small); trade schools for the mechanical, building and other trades; horological schools, navigation schools, intermediate and higher technica for the textile industries. Some of the

institutions of the grade just below the engineering colleges proper also turn out engineers. Indeed, the majority of the German engineers are not graduates of the higher schools at all. No German state makes attendance at trade schools compulsory, neither is a large percentage of the industrial population expected to pass through them, or attend them at all. The trade schools receive State support, however, and are sometimes maintained altogether by the State.

All classes of industrial schools receive State support in Germany, and with State support comes State supervision. In general the vocational schools are conducted in buildings entirely separate from those devoted to either the elementary or the secondary academic schools. The management and supervision of the industrial schools is commonly under the control of a body entirely separate from that which administers the academic instruction and supervises the academic schools. The tendency of European educational systems for the past fifty years has been increasingly in favor of separate management and supervision of industrial schools. Ireland, and more particularly, France, are countries where the necessity of the separation from the academic organization has lately been realized. Gradually, in France, the industrial schools are being put under the supervision of the ministry for commerce and industry or that for agriculture. In Germany the principle of separation has long been established as the result of experience. In Wuerttemberg the apparent exception is not a real one. In that State the trade schools—including the “women’s work schools,” or institutions for the teaching of dress-making, millinery and other trades for women—and the higher technicum for the textile industry, as well as the industrial museums and libraries, are entirely under the control of the Central Office for Commerce and Industry, a department of the Interior Ministry, and the industrial improvement schools, nominally under the public instruction ministry, are in reality under the Central Office for Commerce and Industry. The same fact is true of Austria, where the industrial schools are nominally under the ministry of public instruction, but in reality are controlled by the industrial ministry. Of course, there is hearty co-operation in both cases.

Germany has set the highest standards for the teachers to be employed in industrial schools. Practical workers with teaching ability are preferred. Wherever possible, the combination of pedagogical and technical training is effected. The States set aside scholarships for the training of instructors for the industrial schools, and in general supervise their preparation for the work. The leading departments of other countries do likewise.

It is common for industrial schools throughout Europe to charge tuition fees, although they are generally small. Usually the municipality has the right to do away with the tuition fee if desired. France has a large number of free tuition schools, or scholarships. France is remarkable, likewise, for the great number of trade and industrial improvement schools conducted by trade unions. These institutions are wont to receive subsidies from the State, the department (county) or the municipality. Throughout Europe the industrial schools have the support of the trade unions morally when not financially. In countries where the State provides the institution the trade union usually aids in securing prompt attendance in maintaining scholarships and prizes and in other possible ways.

Denmark has accomplished more than any other European country for agricultural instruction. The schools have been of the type which would admit candidates of very modest academic achievements and give them vocational instruction in short courses.

The principal tendency to be observed in Switzerland is the movement toward compulsory industrial improvement schools for apprentices.

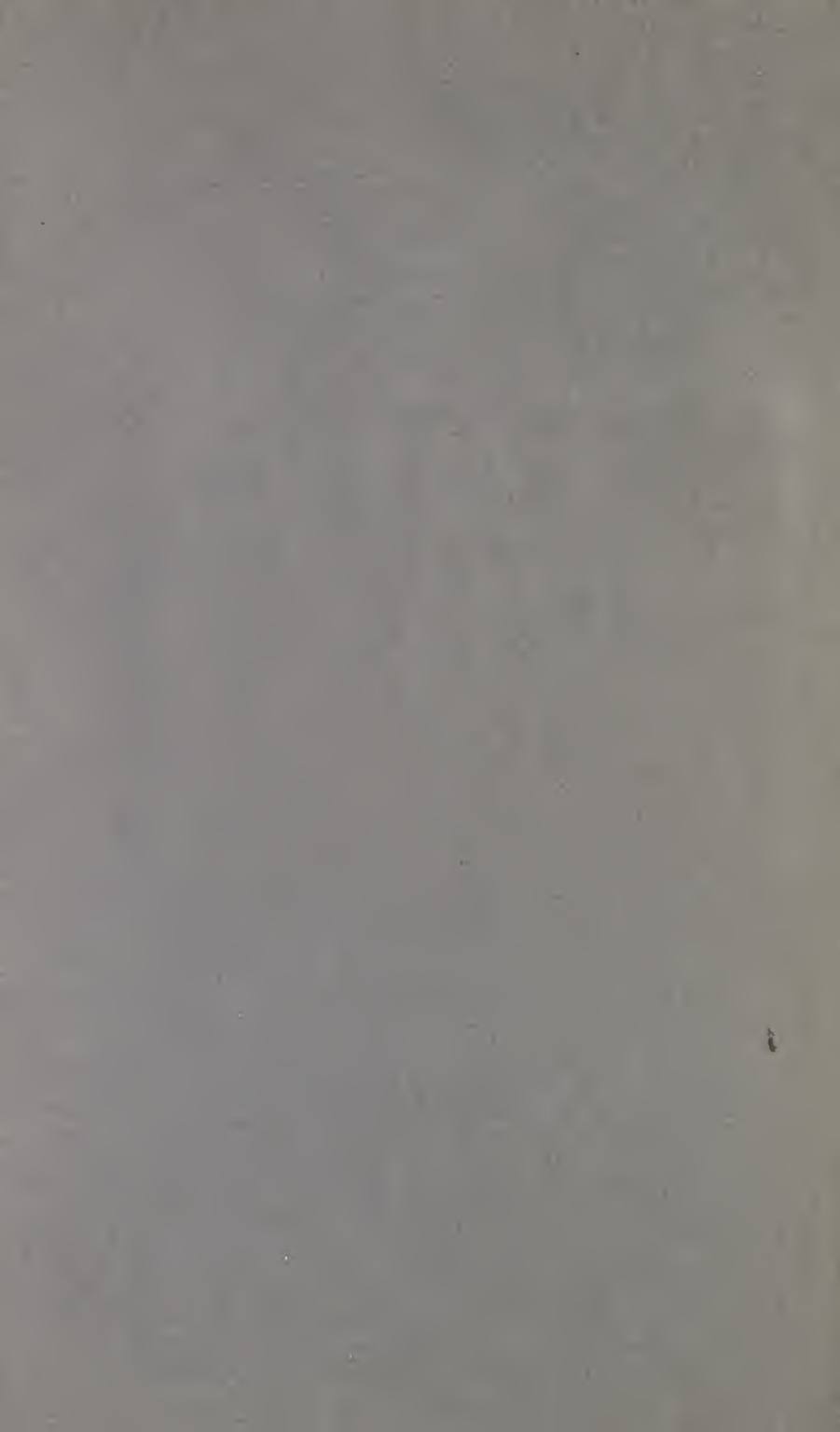
In England the industrial schools have been of very mixed character, largely due to the absence in former days, of technical instruction of engineering grade from the universities. The government aids technical instruction through money grants and inspection. England has lately begun to organize instruction of industrial improvement type to suit the needs of workingmen. Not that instruction for workers has not been offered in England for over half a century, at least in some localities, but it is to be organized to suit the needs of particular trades, as in Germany, and is to reach the masses as well as the few.

The success of the housekeeping schools of Belgium, especially in the training of servants, is to be remarked. Switzerland, Sweden, Holland and Hungary have also achieved good results in this direction of training for the home duties.

The industrial awakening of Northern Italy, largely due to the development of the inexhaustible water-power of the Alps, has been accompanied by the extension of facilities for industrial training, in which the Government is taking a large part.

The establishment of industrial schools for the male population was the first important step in Germany. At present the great movement is in favor of industrial schools, and especially commercial schools, for girls and women.





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